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THE
DENTAL COSMOS:

A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

J. H. McQUILLEN, D.D.S.
GEO. J. ZIEGLER, M.D.

Observe, Compare, Reflect, Record.

VOL. VII.

PHILADELPHIA:
SAMUEL S. WHITE, PUBLISHER,

528 ARCH STREET.

1866.



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THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, AUGUST, 1865.

No. 1.

ORIGINAL COMMUNICATIONS.

CONSULTATION.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE IN THE PHILADELPHIA DENTAL COLLEGE.

IN entering the office of a professional man, intelligent persons do not visit it as they would the workshop of a mechanic, to *order* the construction of one or more pieces of mechanism, but they come, when visiting the dentist or surgeon for instance, with the view of securing not only skillful manipulation, but in addition, that which is more rarely afforded of a high order, *advice*, the result of judgment based upon a thorough knowledge of science, and an extended experience in the observation and treatment of disease. Although the variety of cases presenting, to test in this respect the calibre of the dentist, is not so numerous as those which come under the care of the general surgeon, nor attended with the same risk to the patient from erroneous conclusions or practice on the part of the operator, yet the cases which constantly do present themselves are of such a character as to demand the possession of the keenest perceptions, the most extended experience, and the clearest judgment, to enable the practitioner to fully comprehend the nature and extent of the affections: and although the life of the patient may not be put in jeopardy by errors of opinion or practice, the general health, comfort, and appearance may be. This is true even when confining his attention exclusively to the treatment of the teeth. Notwithstanding these facts, the grossest ignorance or carelessness is often manifested in what is regarded as the plain and simple matter of examining a set of teeth with the view of ascertaining the presence or absence of decay. A patient, not impelled by painful sensations, but prompted by that nice sense of regard for the integrity of his teeth which ever characterizes a careful and refined person, calling upon an operator for his *opinion*, is subjected, it may be, to a hurried ex-

amination in an unfavorable light, and with imperfect instruments, and then having been informed that the teeth are in perfect order, departs with the happy consciousness that his mind may be relieved from further anxiety on that score, alas! to be awakened, however, in a few months by unmistakable sensations to the unpleasant fact that a number of them are seriously if not irreparably affected. It is but natural for a patient, under such circumstances, to feel aggrieved, and to anathematize the person in whose judgment and advice he had placed implicit confidence only to be deceived and injured.

As already stated, this result may be due to ignorance or carelessness on the part of the operator; if the first, how can one who is unable to detect the presence of simple cavities be expected to decide correctly upon those frequently intricate and puzzling questions involving the *cause* of pain, and in which the nicest tact and judgment are demanded to decide whether it is due to an exposed nerve, periodontitis, or derangement of some organ in a distant part of the body? or again, how shall he be able to give an opinion upon those affections of the mouth requiring surgical treatment to which his attention will be frequently directed, and an intelligible explanation required as to their origin, nature, and the consequences likely to accompany or follow their presence? Arising, as such ignorance does, from a want of proper instruction, the defect can only be corrected by entering upon a regular and disciplined training, either *alone*, which is most difficult of accomplishment, or under the care of competent and faithful teachers, who shall, by systematic instruction, enable a student to ascertain the seat and nature of any affection which his patients may be suffering under, or, in other words, to form a correct *diagnosis*, and also to *prognose* or foretell the probable course and issue of the disease. Thus armed he is prepared at all times to give a rational opinion and encounter and combat any difficulty. Without such knowledge, it matters not how skillful he may be as a manipulator, he can but be regarded as a mechanic at the best, and is liable to constant errors of judgment, injurious to his patient and humiliating to himself.

Carelessness on the part of those who *know* how to diagnose is always inexcusable. Attributable, as this generally is, to hasty and imperfect examinations, the proper way to remedy it is by taking ample time, securing a perfect illumination of the oral cavity, employing proper instruments, and then *charging* for the *advice* rendered, as a physician, surgeon, or lawyer would when consulted by a patient or client. Patients will gladly pay for an *opinion* that can be relied upon, and justly regard that as very *dear* which, costing them nothing in money, gives a false confidence which shall eventuate to their disadvantage.

Recognizing that the most careful, conscientious, and experienced are liable to errors of judgment, and that the bitter lessons sometimes gained by practitioners in this way have been of the greatest value to them, their

patients, and fellow practitioners, and freely admitting that this has been my own lot in the early years of practice, I propose in a series of regular and systematic papers to offer to the young dentist such information and advice on the principles and practice of the profession, as it may be in my power to afford, as the result of close application as a student and practitioner during the past eighteen years.

SENSITIVE DENTINE—ITS CAUSE AND TREATMENT.

BY DR. CHARLES E. FRANCIS.

Extracts from a paper read before the Brooklyn Dental Association.

SPECULATIONS in this direction have been somewhat numerous, and many a theorizer has turned and twisted the mystified question over and over again in his mind, with an attempt to ascertain its real cause and to establish a true and correct theory concerning it.

That exposed dentine is frequently sensitive, and sometimes extremely so, no dentist can doubt. It occurs in superficial cavities as well as in cavities that penetrate nearly to the pulp. Indeed, we generally find the greatest degree of sensitiveness in that portion of the dentine immediately adjacent to the enamel; but if, in the process of excavating a cavity, any portion of the pulp be wounded, the dentine instantly loses its sensitive character.

It would be very gratifying to the dental profession if a clear and correct theory of this condition could be established, divested of every doubt or nebulous supposition; and a blessed thing it would be for the world if some effective, safe, and reliable remedy could be discovered that would obtund this acute sensibility, and render operations on the teeth less painful.

The nerves of the body are the medium through which painful communications are transmitted to and from the great sensorium. The general supposition therefore is, that where no nerve exists to communicate with the sensorium, the idea of pain is purely imaginary. This seems to be sound doctrine; in fact, it is orthodoxy to the very bone. But here is another fact that *seems* to prove our orthodoxy *paradoxical*. Pain is actually experienced where no nerve can be discovered, and hence the long debated and unsettled question—"Why is dentine ever sensitive?"

This question is frequently asked by our patients, who sometimes rebel at the idea of having us "dig away" (as they say) at their teeth, and wake up a "lively nerve" at each touch of the excavator. The answer to their query is not always satisfactory, for the suffering patient judges by the pain he feels that the nerve of his tooth is actually exposed, or that some little "branch" or "branches" of it must have been laid bare by the instrument.

Now, I do not propose to state any new principle for a solution of this question, for it has sorely puzzled many older heads than mine, but will simply refer to the principal current "explanations," or, more properly, *speculations*, and also give what, to my comprehension, seems the most consistent "explanation" yet offered.

The dentine, as you all know, contains an immense number of very minute cellular fibres, or *tubuli*. These, radiating from the pulp cavity, and running along in an almost parallel yet somewhat undulating course, terminate in the substance of the enamel which seals their peripheral extremities, protecting them from the encroachments of destructive fluids, the changes of temperature, or mechanical violence. That these minute tubuli are traversed by still more minute vessels and nerves, is the belief of many. They even assert that these tiny vessels sometimes contain real red blood. From this I infer that the tubuli, in which red blood is supposed to exist, are of a larger calibre than their neighbors. If this principle is correct, we would presume that if all the other tubules were but a little larger they would be favored alike with little streams of flowing blood. But how can the blood find its way into these tubules? Through what channel does it pass to reach them? The pulp appears to be inclosed in an independent sac, firm and tough. In expressing a doubt as to the correctness of this speculation, I am aware that I differ from some of our standard authors, but I have never seen anything that would lead me to believe that red blood corpuscles ever circulated through the tubuli of dentine.

If, then, these tubules are not traversed by vessel or nerve, why the sense of pain so exquisitely keen at times? There must be *some* cause for it. We have been told that the dentine was charged with electricity, and that the electrical fluid communicates with the nerve, which responds to outside influences. This explanation seems unsatisfactory, to say the least. It has also been supposed that the structure of the dentine is permeated by some subtle fluid, which, when touched with an instrument, is forced back upon the nerve; hence the pain. A very distinguished author stated his belief in the existence of a membrane underlying the enamel, which he termed the "preformative membrane." This he thought completely invested the body of the dentine, and connected with the nerve of the tooth at its apex. He thus accounted for the keen sensitiveness just beneath the enamel. As this sensitiveness is not confined to any particular part of the tooth, I conceived his "theory" a very poor one.

One fact, however, you will all admit. In the substance of every healthy tooth there is a living spirit. A ghostly tenant inhabits every cell of the dentine. Like trusty sentinels, these are thickly arranged on every side of the dental pulp, as if to give warning of approaching danger. Faithful servants they are; they convey nourishment to every part of the pearly casket they inhabit, and sharply protest against encroachments of their destructive enemy.

This dentinal "life presence" is not easily photographed, but it is not inconsistent to believe that, whatever it may be, it must emanate from the membranous sac which invests the pulp, and forms the lining of its bony cell. Here seems to be the nucleus from whence our little messengers radiate, and each messenger is probably an infusion of "liquor sanguinis," bearing the character and mission of *nerve*, and affording the necessary nourishment which the dentine requires. To this "theory" you may object, but I can imagine no better one.

The methods of treating sensitive dentine are various, and each operator has his peculiar manner of dealing with this extremely unpleasant sensation. It is the duty of every good dentist to be as just and faithful as possible to his patient. If, by any means in his power, he can save an undue amount of writhing, torturing pain, when preparing sensitive cavities, and yet perform the operation in an equally thorough and scientific manner, and without injuring the health of the pulp, should he not avail himself of such means? The *fear* of torture has cost many a patient the loss of a valuable tooth! The dreaded operation of having it plugged is delayed from week to week, until the pulp becomes exposed, or the tooth crumbles entirely away. Thus hundreds, yes, thousands, of persons about us are suffering their teeth to go to destruction! Have we not sufficient reason for exerting our best efforts to prevent this dreaded sensitiveness and dissipating such fear? I think I have tried nearly every remedy that reason and common sense has suggested to accomplish this result, and with various grades of success.

In preparing superficial cavities on the buccal and labial surfaces of the teeth, an application of chloride of zinc will very much diminish the sensitiveness. It sometimes produces an acute pain for a few moments, which, however, may be allayed by applying a drop of chloroform. I have on several occasions temporarily filled cavities of this kind with oxymur of zinc, and with very satisfactory results. Quite recently I filled an *extremely* sensitive, crescent-shaped cavity, on the labial surface of a superior cuspid, just below the margin of the gum, with this material. About a fortnight after, I removed the filling, prepared and plugged the cavity thoroughly, (with gold,) to my own and the patient's complete satisfaction, and with comparatively little or no pain.

For deep sensitive cavities, applications of camphorated creosote, or creosote and tannic acid, are safe and generally of benefit. These applications may remain in the teeth from twenty-four hours to two weeks. Hill's stopping, or plain gutta-percha, make excellent cappings, as they perfectly exclude the saliva and do not prevent the teeth thus prepared from being used and cleansed.

I have frequently treated very deep cavities, where but a thin cartilaginous covering barely protected the pulps, by bathing the cavities with creosote, and filling with Bevin's or Hill's stopping. By allowing them

to remain undisturbed for twelve months or more, the pulps will generally recede, and deposit a new bed of secondary dentine for better self-protection. Super-carbonate of soda has been recommended for obtunding sensitive dentine, and I think in some cases has proved slightly beneficial. Rinsing the mouth with lime-water often, for several days before having the teeth operated upon, may also prove of some benefit. Warm burnishers rubbed forcibly over the dentine, and the actual cautery, have also been recommended by one or two operators. These "remedies" *seem* so much worse than the "disease" that I have not, as yet, tested their effect.

The "wedging" process, recently alluded to, may, in some cases, be well to adopt. The pressure of the wedge, when driven between the teeth, forces the apex of the root firmly against the foraminal portion of the nerve, partially choking its circulation, or obstructing its communication with the sensorium, thus rendering the dentine less sensitive.

Administering acidulated tonics for the purpose of clearing out "swamp angels," and bringing up the system to a higher standard of health, will, undoubtedly, better enable a patient to bear *any* surgical operation, but it is not always convenient to adopt this course of treatment in our every-day practice, nor do I believe it would always prove as successful as we could desire.

Many dentists suffer their patients to inhale small doses of chloroform or ether while excavating sensitive teeth.

In preparing approximal cavities, I have recently been in the habit of rubbing prepared chalk, moistened with chloroform, into the cavities. I think it somewhat diminishes the sensitiveness, and polishes the cavities beautifully.

In excavating a tooth, be sure your instrument has a keen edge, and keep the cavity as dry as possible. Always cut in a direction *from* the pulp cavity, following as closely as you are able the course of the dentinal tubules. Commence your task in a gentle manner, and by encouraging words, gain the confidence of your patient. By all means preserve your own patience.

As a "dernier ressort," when all other remedies fail, one agent still remains, which, if properly used, will surely accomplish the desired result. It is that much abused and oft misused substance known as arsenious acid. Undoubtedly it has caused much mischief, and in improper hands may do much more. Like fire or water, it may prove a good servant or a bad master. Its use has been totally condemned by some of our earnest men. So also has creosote had its share of abuse, and to this day is a terror to many a dentist. I would ask if opium, aconite, iodine, creosote, strychnine, ergot, and the whole category of poisonous drugs, should be blotted out of existence, because of the ill results of their *mis-use*? It is the degree of *intelligence* with which these drugs are used that renders

them either blessings or curses. Hydrocyanic acid is the most powerful poison on record. A single drop will destroy human life! Can it not be so diluted as to become a valuable medicine, and perhaps be a means of *saving* life? Our medical profession think so. Just so with arsenious acid; it can be so reduced in strength as to be perfectly controllable, where intelligence is not lacking.

The best formula for using this drug is in combination with creosote and tannin. The proportions may vary. For ordinary use, I would suggest about one part of arsenious acid (by weight) to two or three of tannin, and creosote sufficient to form a paste. The introduction of tannin is of twofold importance. Its great bulk reduces the strength of the arsenic and coagulates the plasmatic exudation at the peripheral extremities of the tubules. Thus, when applied in minute doses, its power is spent on the surface of the dentine. Of course it should never be placed in close proximity with the pulp, unless you *desire* to destroy its vitality. It may remain in a tooth from six to twenty-four hours, according to circumstances, and should be protected by a gutta-percha stopping. It should be used in newly-formed teeth with the greatest caution, and the bottom of the cavity covered with a thin layer of some plastic material, like Hill's stopping.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETTSON, M.D.

IN the hope of being useful to that class of young practitioners whose ambition it is to make themselves and their profession in the highest degree serviceable to mankind, I have proposed to myself the pleasure of studying with them in a few papers, and in as practical a manner as possible, the complex subject of maxillary tumors. I have chosen this special direction of oral trouble because I know from a somewhat intimate knowledge with the literature of the subject as enunciated by surgical writers, and from a very practical acquaintance with the various conditions as met with in an every-day practice, that such study is not made without much confusing difficulty from text-books, or without much misconception from the mouth. The nomenclature in the first has never come to a proper arrangement; the phenomena in the latter admit of an easy misreading. And yet I will be excused in saying to such as I address, that the subject properly viewed and properly studied is capable of as plain an understanding as any of the various other conditions in surgery; the treatment may be as decided, the prognosis as fully inferred.

We will start out then in our study by remarking that the consideration of special classes of tumors is to be preceded by an accurate scientific appreciation of certain general, governing, or underlying principles.

1st. Tumors of this location, like tumors of other bones, and like tumors of the soft parts, are benign and malignant, analogous and heterogeneous.

2d. The maxillary bones, because of their great vascularity and exposure to sources of irritation, are, perhaps, more disposed to enter on pathological conditions than any other of the ossa corporea.

3d. The principal source of irritation to the maxillary bones is to be found in diseased teeth.

4th. Malignant tumors of these bones are perhaps to be esteemed only as the local exhibitions of a pre-existing cachexia. The character of the diseased action, the result of local injury, will be determined by diathesis.

5th. Tumors of the maxillary bones which may, with most assurance, be looked on as benign, are the encysted, the common inflammatory, and the exostosis.

6th. Those, the character of which may be esteemed doubtful, if not always malignant, are the osteo-sarcoma—fibro-plastic—the osteo-melanosis, and the osteo-cephaloma. The term osteo-cancer, or carcinoma, when employed may refer to any of the above forms, expressing alone the malignancy, and not the peculiarity, of pathological condition. In other words, there are several forms of maxillary cancer.

7th. There is not, unfrequently, such a running together, so to speak, of the appearances presented by the benign and malignant growths as to render the distinctive diagnostic signs only appreciable, if, indeed, at all so, to the very experienced. Certain general features, however, associate commonly with the two lesions, which are to be studied with the greatest advantage.

1. Benign tumors, it will be found, are mostly to be referred to some cause, and are apt to be found in proportion to this cause. They are found circumscribed by healthy structures: lymph in a greater or lesser state of organization surrounding and marking their line of extent.

2. They do not seem to have other than the most innocent relation with adjoining organs; any disturbance of function from their presence being referable to mechanical rather than to pathological causes.

3. In structure they are found homologous; they represent more or less truly the parts to which they are allied, and possess scarcely any other than a single formative capacity. They do not defy constitutional treatment, but are more or less influenced by it. If removed by the knife, they do not return.

1. Malignant tumors are, on the contrary, not at all in proportion to a cause which may seem to be the provocative. They are not healthily circumscribed, but their elementary particles are most apt to be found infiltrated, inserted, or diffused in the interspaces and cavities of the tissues in which they lie. They are associated with a cachexia which is not unfrequently more marked than the local disorder. Thus the *vis vitæ* is

not unfrequently so prostrated that the patient is found dying with systemic depression. (The common idea that the cancer patient has the color of a cold buckwheat cake is not entirely without truth; it is not always seen, but, I believe, exists in the greater proportion of cases.)

2. A marked diagnostic sign (perhaps the most marked) of a cancerous tumor is the effect of its presence on the surrounding glandular structures; these becoming enlarged and indurated, and remaining so.

3. The removal of any supposed cause, or the removal of a cancerous tumor itself, will not effect a cure.

4. In structure, cancer growths are heterologous, for even if it be contended that microscopically their minute histology implies only arrestation of normal development, as exhibited in the caudate cell of the embryo, yet, I think, comparison cannot be carried to the varying character of the primary granules; these, as I know them, are not common to any growth except the malignant.

5. True cancer seems not amenable to any constitutional treatment. There are, I think, the best of reasons for inferring that all reports of cases cured have originated in mistaken diagnosis.

6. Malignant tumors have, through the cachexia, a varying formative capacity, they multiply and propagate, as it were, themselves; if one is removed, a second comes to take its place; either appearing in the site of removal, or in some other locality.

The above then, we say, are the principles which are to have all influences in directing our consideration of maxillary tumors. If we comprehend them in their direct and collateral relations, we are prepared to pass to the special subjects of our study.

And first: "The Benign Tumors," "The Cystic," "The Common Inflammatory," "The Exostosis."

(To be continued.)

ANNIVERSARY OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY WM. H. ATKINSON, M.D.

IN a disquisition upon bodies, individual or associate, it becomes of the first moment to understand and display the function and status of the elements composing them.

This can be done in no way so well as by following the plan by which nature produces, sustains, modifies, and advances the individual bodies of which she builds communities or associate bodies.

The fitness of the constituents in character and health will give the measure of their aggregate harmonial force in combination or correlation of their activities.

In human bodies there is an ever-present supply of forming and formed tissues, composing the organs whose harmonious correlation constitute the individuality or personality, in which these hold the relation of antecedents and sequents, whose constant round of activity must be kept up to supply the polarity, mobility, and consolidation necessary to the performance of the various functions of the organism in which we live.

Each constituent cell, composing the solids of our bodies, has passed the ordeal of complete solution and interblending of its seen and unseen primates, whose spontaneous movements caused "*infusorial*" or "*germinal mass*" to take on granular (nuclear) and cellular configurations, constituting the cell a primal individual with definite function, which is in itself the infinitesimal expression of all possibility of form and function throughout the entire range of living bodies.

Thus, then, in the individual (cell) we have the type of all planetary existence, whose riddle, when once fully solved, accounts for all concentration and distribution of force, the correlation and conservation of which so perplex the infantile philosophy of the past and present priests of nature who obstruct, rather than open, the portals to the temple of *science*.

Science means to know! How truly hath it been said that we know but in part! Science has heretofore been but a reflected pencil of light, a few of whose rays, prismaticized and diffused, alone have found lodgment upon the tablet of perception; but, thank a kind Providence, the pain and sadness which we feel in view of our own and others' deficiencies in possessing but fractional knowledge is beneficently mitigated by the hope and the promise that that which is now but in part shall be done away in the coming advent of perfect knowledge.

Then knowledge will be direct, intuitive, certain, satisfactory, and abiding. No more half demonstrations, no more vacillation, no more forgetting the paths already trod, will then obstruct our progress! then men of science will be the rule, instead of, as now, the exception; the attraction and delight instead of the repulsion and disgust of the masses. Does any one say this can never be? Let me turn to the history of the past, whose pages are running over, full of anathemas invoked upon the heads of "*innovators*," as it has been fashionable to denominate nature's own priests, who have, from time to time, sealed their fidelity to her teachings with loss of ease, comfort, fortune, fame, and, in not a few instances, life itself, to whose memory posterity has erected memorials of recognition and honor in the senseless shape of sky-piercing shafts of stone, utterly failing to pay the higher homage of implicit obedience to the laws of nature, the simple announcement of which cost the martyrs their lives.

What, then, is the secret of success in bringing together the molecules that constitute men, or men who constitute the societies, sacred, secular, and professional, with which we and nature have to do?

The secret and the power reside in the solvent capable of setting up attractions equalizing the opposing currents. Atmosphere, water, and heat are the prime requisites to solution in organic primates. Love of the truth and love of the race is the proper solvent by which to fit men to harmoniously work toward a common end with unremitting purpose.

He who loves abstract truth alone, and has no love of race, has no mission in associate capacity, and he who loves the race alone, and although overflowing in kindliness, sympathy, and the desire to please, is yet careless of truth, is unreliable, and hence a discordant molecule in the body.

To speak of the rise and progress of dental societies in general, or this one in particular, involves the detail of the becoming dentists of those who first came together in associate capacity in this and other countries.

Who the first dentist was, and of what attainments he could boast, is not satisfactorily put upon any record within our reach, nor do we certainly know at what place dentists first came together in a professional capacity for professional purposes.

Therefore, as details might expose ignorance or invidious disposition to the apprehension of those who always know all that has ever been said or done from the very earliest times, let us busy ourselves with that which more nearly concerns us on this anniversary occasion.

Convinced that a coming together was a necessity to advancement, a few dentists responded to a call issued for that purpose on the 13th day of March, 1860. For awhile meetings were held once a week, and then fell off.

A few noble souls struggled along, keeping the society alive, with much labor and varied success, until the fall (Nov. 12) of 1861. During that fall and winter more frequent meetings were inaugurated, which awakened an increased interest in the sessions of the body. This proved a boisterous and somewhat discordant season, owing, principally, to one or two crotchety, restless spirits, who persisted in uselessly wasting the time of the members by untimely and unprofitable motions, debates on constitutionalities, and manifestations of "pure cussedness" in general.

At length the arch-traitor sprang a constitutional dodge to disfranchise members who were obnoxious to his tastes and feelings that resulted in his being hoisted by his own petard, and thus the society happily became rid of his ungracious presence after some seasons of trial on his part to reinstate himself against the will and the precedent proceedings of the society. From that time till the present we have enjoyed a comparative harmony and certainly profitable sessions twice a month with the exception of August of each year.

There have been elected to membership about 100, of whom 73 have signed the constitution. There has been an average attendance of, say 23 members.

Here, as in all other bodies, the many have played the part of cells ready to be fed and favored, remaining satisfied to be passive rather than active members of the body. One of the bones of contention that disturbed the harmony of the body arose from the opposition of a few members to electing delegates to the American Dental Association. The persistent refusal to pass a resolution to this effect determined a number of the members of this society to form the Brooklyn Dental Association for the expressed purpose of being represented in the American Dental Association, which took effect on the 11th, 12th, and 13th days of June, 1862. Thus the firstborn offspring of the Society of Dental Surgeons of New York was begotten, gestated, and safely delivered from uterine constraint. The dear mother was extremely anxious lest her daring child should transcend her in the affections of her lovers, and thus prove the death of her. But she, like good daughters always do, only enhanced her mother's charms by enlivening her, by introducing her young and vigorous lovers to the parent society, of which the majority became members, thus dispelling the unnecessary maternal solicitude, and securing general harmony in feeling and practice, in society and office.

Many projects for the improvement of the profession at large and our body in particular have been attempted on the part of various members, which, for want of persistency and consistent unity of action, have thus far fallen to the level of inaction, if not final death.

Reiterated resolves, and committee after committee, have been indulged in to inaugurate the publication of a volume of transactions in some form, which, for lack of intensity of interest and working heads and hands, have all proved abortive.

At one time, this society, in connection with the Brooklyn Dental Association, passed resolutions and empowered committees to take measures to establish lectures upon Dentistry in this city, which, for a time, bade fair to prosper, but in an evil hour, doubt, if not a worse and meaner spirit, prevailed, and all that had been done was reversed by a resolution to disclaim any pecuniary responsibility in the affair, thus leaving the committee without even a vote of discharge from further duty to discharge the obligations they had assumed in pursuance of their functions as a committee to rent rooms and engage a corps of teachers as best they might, with the comforting codicil to the ignoring resolution that "we as individuals" recommend the "financial aspect" to the very favorable consideration of "individuals," etc. etc.

Dishonorable and unjust as the society, as a body, has made itself by its inconsistent and conflicting resolves, nevertheless, through the exertions of members in individual capacity, there has been some progress made toward establishing a school of dentistry in our midst. A charter has been regularly drawn up in the form of a bill of incorporation, copies of which have been presented to the Senate and Assembly now in session

at Albany, and been favorably reported upon before both houses, with prospects of an early passage into a law.* This, with much else of progress and fraternity, we owe to association, notwithstanding all the pull-backs of friction in the new and untried or ill-made machinery we could bring into the field.

If testimony to the advantages of association, frequent and fervent, were necessary, a casual glance at the character of the discussions, purposes, and modes of practice now and heretofore prevalent among the members of this body will afford a triumphant vindication of the course this society has so persistently pursued in frequent meetings.

It is pertinent in this connection to inquire what are the elements of success, harmony, and progress, and what those of discord, regress, and failure?

The great element of success is urbanity, coupled with ability; of harmony, fraternity; and of progress, devotion to demonstrated TRUTH!

If these things be in you, and abound, discord, forgetting, and failure will be unknown, and not so much as once named among you.

The elements of discord are all at the bidding of their leader, the arch-fiend, *ignorance*.

Regress follows close upon the heels of mental and moral inaction; and failure is the just reward of assumption and assurance founded on the quicksands of ignorance and selfishness.

In one word, then, the key-note of all association is LOVE.

And the highest object of love is TRUTH, impersonal and personal! Love of nature is a divinizing element in the ratio of its breadth and strength.

Love of knowledge is the sheet-anchor to the morals and mentals of individuals and societies.

What else but this has sustained us as a society, and brought us in practice, (I mean the older members,) from barbarous mutilations of human mouths to the justly and dearly-earned cognomen of a beneficent and efficient profession, conservative and redemptive of the organs we once destroyed!

Let us not stop here, but, as our relish for improvement is enhanced with our experience, push vigorously forward into the hilly country, between whose elevations sleep quiet, clear lakes, and murmur limpid streams, irrigating their banks, making the land productive and beautiful to behold, whose very memory shall forever after be of refining power and presence to all those who have taken the poetic significance of the grassy plain, sparkling river, majestic ocean, starry firmament, or sunlit universe, from which to draw the holy inspirations that thrill the remotest portions of our being, and strengthen us by the afflatus of poetic enthusiasm

* The charter has since been granted.

to offer our every act, personal or professional, in serving our race, as our highest conception of the goodness of use—the altar where we worship our God.

March 8, 1865.

ORTHODONTIA.

BY J. FOSTER FLAGG, D.D.S.,

Professor of Institutes of Dentistry in the Philadelphia Dental College.

HAVING, during the past eight or ten years, given especial attention to the correction of dental irregularities, and having enjoyed a gratifying amount of success, while, at the same time, submitting to a fair share of failures, it has seemed to me that a presentation of some of the ideas as to the origin of these difficulties which have forced themselves upon me, together with descriptions of the varied forms which present for the exercise of dental skill in their correction, would naturally lead to suggestions so simplifying the methods of treatment as to render others more willing to undertake cases in a department which is almost proverbially non-compensating.

So far as my own experience would indicate, I regard the "irregularity" portion of my practice as decidedly compensating, and that, too, at quite moderate charges; and I would wish to be distinctly understood as referring to *pecuniary* compensation, and by no means to that charming, but slightly theoretic, equivalent, "the satisfaction of conferring the benefits of science upon one's fellow-creatures!" which, though truly pleasing indulgence within certain limits, becomes, when carried to excess, very like "old school" methods of irregularity correction, in that it is exceeding hard for the toughest professional constitutions to endure.

It will, I think, be readily conceded that a regular denture is the crowning beauty of the human face, and it is undoubtedly the *varied* regularity of the teeth, which actually originates an immensity of what we are pleased to term "varied expression,"—the prominence of centrals with marked recession of laterals, and inversely the prominence of laterals with slightly depressed centrals—the little separation between centrals, the overlapping slant of a lateral, are each *in place* the secret "life" of the pearls in the casket, and deviations from normality in position become less or more hideous only as they are smaller or greater.

Be a face never so brilliant, a laughing betrayal of dental irregularity will rivet the attention, to the exclusion of all else; be a face never so pleasing, with a smiling revelation of deformity, one's pleasure is overshadowed with regret; this being so, it certainly is worthy the consideration of the wisest among us, that plans be devised and suggestions promulgated, which shall eventuate, if possible, in the comparatively comfortable removal of these conditions; and, moreover, that at the same time

honest labor shall reap its proper reward without unduly taxing the unfortunates who apply to us for relief.

The exact causes for many individual cases of irregularity are involved in the same mysteries of "point" development which govern the growth of "crooked sticks" in all departments; but I think that this fact should only make us inquire the more closely into the probable cause of each case, and in this manner gradually narrow the circle of dubious etiology in connection with dubious orthodontia, until it shall favorably compare with the almost mathematical accuracy which characterizes our diagnosis in connection with odontalgia.

I would propose as the first and most obscure cause of "irregularity" (at least in our own country) that intimate commingling of all nations and all individual national peculiarities which forms the American nation; and I would state that I have been led to this conclusion by a somewhat extended course of observation and inquiry directed toward the elimination of this suggestion. I have noticed, with remarkable frequency, the small and narrow teeth of a thin and delicate mother placed in the broad jaws which her offspring palpably derived from its father, resulting in that range of spaces which is so effectually destructive of beauty in teeth, while, on the other hand, it is by no means infrequent that the broad, strong teeth of a father are so jammed and crowded together in an almost childish jaw inherited from a tiny mother, as to fill the beholder with disgust, and the dental practitioner with forebodings as to the possibility, to say nothing of the probability, of his remedying the evil without resorting to wholesale extraction.

(To be continued.)

INSTRUCTING PATIENTS.

BY L. D. SHEPARD, D.D.S.

Read before the Massachusetts Dental Society, at Boston, June 5, 1865, and the Connecticut Valley Dental Association, at Northampton, Mass., June 13, 1865.

"KNOW THYSELF" is a maxim as wise as it is old. Antiquity proclaimed it, and age after age has re-echoed its truth.

"Man, know thyself," is the foundation and end of all true science.

In the investigation of this problem have been engaged the greatest minds of earth. Upon it is founded the whole superstructure of medical science, of intellectual and moral science.

Its object is the elevation of the race, physically and morally.

A *thorough* knowledge of one's self! Who has it? And yet great progress has been made in the advancing centuries. Is it presumptuous in us, as a profession, to claim a share in this progress? Have not our investigations enlarged the sphere of human knowledge? Let us inquire

in what way we can help on the great cause, and still further ameliorate the condition of our race.

It is not pertinent to this article to discuss the fitness of all who profess to be Doctors of Dental Surgery.

The carpenter of last month dubs himself doctor this. Doubtless he has obeyed the maxim, "know thyself," and feels assured that his previous use of the plane and chisel (and mallet I may add) has given him skill in the use of instruments, and his previous mental discipline in the planning and constructing of buildings has given his intellect uncommon acumen, so that but a very short period is requisite for *him* to merit the title of "learned," which you know is the simple meaning of the Latin term "doctor."

We will take it for granted that all who profess and call themselves doctors have thoroughly mastered the principles of dental science, and made themselves skillful in its practice.

Our doctor knows what should be done, and can do it well—and yet in his office routine he every day meets with difficulties, the same repeated day after day, until his patience is sorely tried.

Some of these embarrassments are due to the peculiar circumstances of the case, and hence are unavoidable and ever to be expected. Such try the patience but little; on the contrary, are rather enjoyed as affording new opportunities for the exercise of skill and invention. The ambitious artist courts such difficulties. "The brave and active conquer difficulties by daring to attempt them."

But there are other difficulties, which daily try us, of a different nature. They are to be referred mainly to the lamentable ignorance of the public on this important subject. The great majority of people, embracing every class, even physicians, are sadly at fault on this question. This I consider the greatest obstacle we have to contend with in pursuing an enlightened and high-toned style of practice. The public cannot understand that one style of work may be right and another wrong, nor can it see the difference between two styles, although daylight and darkness may not be more unlike than the two. The malign influence of this ignorance is felt all through life, from the cradle, aye, back of that, to the grave. No class is exempt, and no age free from it.

If I rightly conceive our duty as members of an enlightened profession, we are not only to "repair the waste places," and build again the ruined temples, banish disease and reinstate health on her throne, but like the beacon light on the trackless main, warn all within our influence of their danger, illuminate their darkened understandings, and fulfill a higher calling, that of *conservators* of health.

This idea should be ever present. We should permit no one to leave the office without some new information of value. Such opportunities crowd upon us. We have not a dull and sleepy school to teach, but shall

find each scholar awake and interested. True, some things cannot be made plain to the majority, but most can be. At least we can correct their errors, although not enabling them to understand *the why*. Much has been said and written on the subject of the education of the people in regard to these valuable organs. Many plans have been proposed and advocated. One of these plans proposes to make use of the public prints. I have found it of much value in my limited experience, and have noticed much good from its practice. If done modestly and *anonymously* it avoids the appearance of empiricism, which is its greatest danger.

In my former place of practice I availed myself of the local newspaper. The most of my communications were reports of the meetings of the Connecticut Valley Association. In these I gave an account of its discussions, etc., and interwove such items of information as I desired to inform the public upon. These reports were generally first prepared for the local papers published in the various towns where our meetings were held from time to time, and from them copied, at my request, into my own town paper, and credited to the original paper. The preparation of such a report was part of my duty as Secretary. A copy of the original paper was sent to each member, to enable him to have the same copied into his local paper. In this way the community was reached throughout the valley. The report being anonymous, appeared to be copied by the papers as a part of the floating news. As to the results of this course, I can testify only in regard to my own town. At first, when people read that such a society had been formed, they supposed it was similar to the various trades unions, and had reference only to the regulation of fees. We heard this expressed, and the question frequently, "What else have you to discuss?" But after reading the reports of two years of such meetings they found that our field of discussions embraced many subjects of much interest to the profession, and of even greater importance to themselves. They did finally understand that this expenditure of time and money on our part was designed for their good as well as our own. I have mentioned this case as an illustration of a mode of using the public prints, compatible with professional dignity, and of great advantage to the public.

The issuing of tracts and small books has been a favorite with some. I have seen a very few such which I could approve, but must condemn the majority as specimens of the baldest empiricism, conceived in egotism, and stained all through with unblushing self-adulation—a paying investment, as an advertisement, I doubt not, but decidedly unprofessional, and of doubtful utility as a medium of popular education.

But as the *spoken* word of the orator moves his auditors far more than the reading of his speech, so shall we find that it is in our *daily contact* with our patients that the *chief* and *best* field for educating the people is

afforded. As in the Grecian academy the ambitious disciple drank in the words of wisdom which fell from the lips of the great masters.

When our patients come to us, they generally come with their minds made up as to what operations they desire. They want this tooth extracted, or that one filled, or an artificial denture of such material, etc. We may obey them, and do as they wish, or we may be guided by our own judgment of what is best for them. If we adopt the latter course, is it sufficient to simply tell them what they need, or shall we explain to them their mistake, and the reasons for a different course from that they had resolved upon?

To illustrate my proposition, permit me to refer to a few of the most common of the popular errors, nor can I fully illustrate the principle without explaining my method of meeting these errors as they come up in my office from day to day.

How common is the misconception of the change which takes place after extraction, before the mouth is ready for the so-called permanent set! "How long will it take my mouth to heal?" is the general question, or "my gums are healed, I should think." The doctor tells them that enough absorption has not taken place, or that the alveolar process is not enough absorbed. What do they know of absorption and process? They cannot see it. The mouth seems hard and firm. Here we can explain the whole phenomenon in technical terms, or we can simply tell them that there is a soft spongy bone, porous like pumice-stone, which lies above the jaw-bone, whose duty it is to keep the teeth firm in their sockets, and that when the teeth are taken out its use is gone, and, in the economy of nature, the major part of it is dissolved and carried off, and that it takes several months, varying in different persons, for nature to do this work. Hence they will see that a set which, introduced soon after extraction, fitted well, will soon lose its adaptation. "Very well, sir," they say, "I now understand the subject perfectly, and see why, unless I have two sets, I must wait."

How many of our patients can tell where the nerve is located? How frequent, on the first introduction of the instrument to a sensitive cavity, do we hear the cry, "Oh, dear! you have touched the nerve!" I reply, "My dear madam, do you know how a tooth is made, and where the nerve is located?" A negative answer is the rule. Before proceeding further I invariably stop and enlighten them. Ever bearing in mind that the eye is much more readily informed than the ear, it should be our rule, when possible, to make ourselves understood by models or drawings rather than an explanation. With this view I have several preparations of teeth ground so as to show the location and shape of the nerve, pulp, etc., as well as the thickness of the enamel and other characteristics of the organ. A few minutes of time thus occupied, and you have an intelligent patient to operate for. She is reassured, gives you her entire

confidence, feels that she is in the hands of one who knows where he is, and hence becomes quiet and patient under severe suffering. Understanding why it is necessary, she bears it.

In this connection the explanation of alveolar abscess comes in. The patient can readily understand, after seeing such a model, how such a mass of nervous tissue, when deprived of vitality, becomes decomposed and a source of irritation. She apprehends why a tooth can cause pain after the nerve is dead. She sees at a glance the necessity of removing the pulp and thoroughly filling the root. Some of these prepared teeth have been in use for years, and I cannot conceive how I could get along without them, especially in those cases where the nerve is involved. I want my patient to understand thoroughly what I am trying to do for him. In that case, he not only appreciates the operation, but can be of considerable assistance. I want him to know enough of the subject to give me information of the progress of the case, thereby saving my remembering what has been done on previous visits. When one has many cases on hand, which he treats from day to day for weeks, there is danger of mixing up the cases and the treatment, unless one has a very clear head or keeps a full record in writing from day to day. But each patient can keep the record for you *accurately*, provided you thus make him *competent* to assist you. No one but has experienced the truth of the axiom—that our most intelligent patients are the best.

Perhaps there is no topic in regard to which people are more ignorant than the importance of the deciduous teeth, and their relation to the condition of the mouth in after-years. On this point we should be particularly careful not to lose any opportunity of giving information. We are all familiar with the surprise expressed by every one who happens in the office when we are operating for a child of three to six years. "What's the use of filling teeth for so young a child?" they ask. I know of some operators who make but a commonplace reply to this question and others of the kind. Rather should we not rejoice that such questions give us an opportunity *gracefully* to elucidate the true theory and impress it upon their minds?

When mothers bring young children to us for an extraction, or any other object, it is very easy to interest the mother in the condition, growth, and care of the teeth of her much-loved child. By a few moments' conversation we can so enlighten her that she afterward becomes an ever-watchful ally to us in the regulation and health of the teeth of all her children.

Not a day passes but we are told of the six-year molars: "This is one of my first teeth, which I have never shed, and hence do not wish to make any attempt to preserve it." "True," I reply, "and over a third of a full-grown man's teeth are *first* teeth." An incredulous look follows. They cannot believe you till you have explained to them that as a child has but

ten teeth in each jaw, and a grown person sixteen, six of these sixteen must be first teeth, or in other words, had no predecessors. They reply, "This one surely cannot be one of my permanent teeth, for it came before I had shed any of my temporary teeth." How easy, in a few minutes, to tell them the order of the eruption of the permanent teeth! They will admire with you the wonderful arrangement of nature's law, by which this tooth is placed as a sentinel to guard the outposts while the reorganization of the main force is being effected. How beautiful is the economy of nature in this respect! In fact what part of our intricate organism can we look into but we are filled with wonder and admiration at the incomparable wisdom displayed! We exclaim with Watts:—

"Strange that a harp of thousand strings
Should keep in tune so long."

As a rule, I never look into the mouth of a child but I inform the mother of the importance of these six-year molars. In nine cases out of ten she has either not known of their existence—they came through so easily—or has supposed them temporary. You remember in the statistics of Tomes, out of 3000 teeth extracted, 1124 were these first molars—one-third of the teeth extracted being these same teeth. While not denying that they are more liable to caries than others, and sometimes demand removal on account of the good of the others, I contend that the main cause of this wholesale "slaughter of the innocents" is the mistaken idea that they are intended to be replaced. I know good practitioners of medicine who have been under the same delusion, and even argued that they were right and I wrong when I told them of their mistake.

We have all been annoyed at the many stumbling-blocks thrown in our way by physicians of whom we had reason to expect better things. Unintentional, all of them, and on this account charity would induce us to regard them as pardonable, but all to be referred to ignorance, and hence, in reality, inexcusable. They ought to know what is right or keep silence. By embracing all opportunities for familiar conversation with them, we can ascertain whether their views are correct, and if not, remove their errors, and make them also our allies in the amelioration of coming generations. Their opportunities for good in this respect, especially in the case of children, are much greater than ours. How important that they be correctly informed!

There are many other topics upon which we should enlighten our patients. I will take time to refer to but a few others. Our patients often tell us that their teeth do not decay but drop out. Some call it a canker of the gums, etc. You may say that since the evil is done, and cannot be remedied, we might pass it over in silence. Very true, if they only were concerned, but the good of their children demands that they should know that this dropping out is due generally to their neglect in not keeping the teeth free from calculus. I am afraid that some operators say little on this subject, as they thereby avoid one of the most disagree-

able and offensive operations we have to perform. Comment on such a lack of principle is unnecessary. Well is it for us to see to it that in the great day of reckoning, through our neglect to perform our known duty, these important organs may not be required at our hands. How can we hope for godliness if we neglect its neighbor cleanliness in our practice, or in our preaching from day to day? On this subject we should be particularly wide awake. We can also explain why, when a filling has just been introduced, the tooth is so sensitive to thermal changes. This after-sensitiveness often surprises people who have never had fillings introduced before. A word at the time of filling prepares them to expect it. Large cavities, sometimes involving the pulp, are often presented to us with the remark that the organ decayed very fast, the discovery of which was caused, as we all know, by the sudden breaking away of the overlying enamel, undermined by caries of long standing. The explanation of the reason of its sudden appearance, with the remark that an examination by a competent dentist would have revealed it long ago, ere it had made so disastrous progress, will impress upon the patient the necessity of frequent examination of the mouth, and thereby put him on his guard in the future.

I have presented but a few of the many popular errors which might be enlarged upon, and which it is our duty to ever bear in mind in our intercourse with the public, but enough I think to impress upon us the great importance of our too often neglected duty in this respect. A duty which we owe to ourselves, if we desire to pursue a high-toned practice, and would have intelligent and appreciative patients. A duty which we owe to the profession, for the more enlightened the public are, the higher class of operations will they demand or have now, thereby necessitating greater skill and knowledge on the part of the operator. And a duty which we owe to the public if we are, as we claim, not mere artisans, but members of a *learned profession*, occupying an elevated position, and consulted by the masses for *advice* and *instruction*, as is the case with all truly learned professions.

CRYSTAL GOLD.—CRYSTAL GOLD FOIL.

BY C. A. MARVIN, D.D.S.

Read before the Brooklyn Dental Association.

It is a common practice among the advocates of any theory, to seek to erect that theory upon the ruins of any and every other. Hence more and greater effort is expended in demolishing opposing or rival theories, than in proving or substantiating the favored one.

This is an error. It requires something more than the destruction of another man's house to build our own, and however well a disputant may succeed in overthrowing the theories held by others, their overthrow does not make his any firmer, nor command for it the assent or respect of

those who witness his efforts. In order to do this, he must state his theory clearly, so that it can be understood.

He must then prove its correctness and establish its consistency. He must strengthen it by argument. When this is done, he may hope to secure for it favor, and support.

Now if this criticism applies to theories or systems of belief, or general principles, it certainly applies, with equal if not greater force, to matters of minor importance or minor extent.

And in dentistry, (for I wish to apply these remarks to our own science,) in dentistry, which is a practical science, there are not only *theories* to be held or rejected, but many varieties of *practice* to be pursued.

Operations present themselves for performance, of almost every conceivable variety.

Not only do they differ in character, but also in extent.

Some are extensive, but simple; some less extensive, but exceedingly intricate; and some both extensive and difficult, calling for the employment of all the resources of knowledge and skill which the operator may possess.

Difficulties, extraneous to the operation itself, also arise, often of the most perplexing character.

Now in giving proper attention to all these classes of cases, various methods of procedure must be resorted to, and in regard to the comparative efficacy of these various methods, great differences of opinion exist.

And it is in the discussion of these various methods, that the error which I have named is too often found to prevail.

For instance, one practitioner may have decided upon a certain method or appliance to overcome certain difficulties which have arisen in his practice, and, by perseverance in its use, may have made it of very great assistance to him, so much so as to feel no more dread of those same difficulties, when they arise, than of any others: for he has a method or appliance with which he can control the case and attain success.

Elated by his discovery, and its benefit to him, he at once introduces it to the notice of the profession, as the "*ne plus ultra*" of all methods and all appliances. And, not content with telling its virtues, he also makes a raid upon all and every other contrivance, which was intended to accomplish the same ends, pronouncing them of little or no practical benefit. This imaginary case will illustrate my meaning sufficiently, and serve to show how irrational and inconclusive such reasoning is.

As with methods and apparatus, so also with material.

Every dentist has his favorite material for filling teeth. That which he considers superior to all others; that with which he can secure the best results. With most, if not all, in this day, that material is gold—pure gold. But in what form? As is well known, gold is prepared for the dentist's use in two forms: one being beaten out to a very remote degree of thinness, yet still possessing a good degree of strength, and

called foil; the other being gathered in a mass, loose in consistency and fibrous in detail, called sponge, or crystal gold.

Again, the *foil* comes in two varieties, adhesive and non-adhesive or soft foil. Now these are the *general* distinctions in the preparation of gold for filling teeth. There are also *minor* differences, resulting from the different modes of manipulation by different manufacturers, the gold made by one establishment possessing certain excellencies which others lack, and *vice versa*. Amid this variety in the material, is it not natural that there should be difference of opinion among those who use it? Some prefer one form, some the other. Some favor a certain manufacturer, others another. Some use adhesive gold exclusively; others associate it in their practice with the non-adhesive; others never use it.

Just so is it with crystal gold. It, too, has its supporters, some of whom deem it pre-eminently superior to all other forms of gold. Some find no case where it will not fully meet all that is required; others tolerate it only, finding, occasionally, a benefit in using it; while some see no good at all in it.

Such being the case, I propose to examine a little into this form of gold-filling, which, to some of us, is not new, and to others, it may be, is.

Indulge me in one general remark more, however, and it is an important one.

The prime object of discussions upon scientific subjects *is not to bring all to the same opinion*.

By no means! It is this: *To elicit from each his opinion, with the reasons for it, that the mass of knowledge respecting the topic under discussion may be increased, and all be profited.*

Now for Crystal Gold.

I have a very high opinion of crystal gold. Have used it with great satisfaction, and a comfortable degree of success.

But, having said this, I do not propose to follow it with the remark that *foil* is good for nothing. It would be folly for me to say so. I should be contradicted by my own experience and by yours. It does not militate against the excellence of crystal gold that crystal gold foil is also good; neither is it necessary to cast away as worthless the sponge gold in order to place above question the value of the foil. Cannot both be good? Cannot I speak for both? My paper is not entitled crystal gold *versus* crystal gold foil, but crystal gold *and* crystal gold foil.

They are children of the same parent. I like them both. One has, indeed, worked itself a little farther into my affections than the other, but, in doing so, has not crowded that other entirely out,—only shot by it, that is all. I still use both; crystal gold generally, foil occasionally.

As regards the property of adhesiveness, crystal gold differs not materially from foil. Both can be employed, as is well known, in “building up” broken teeth to any desired extent. With both, *solidity* can be secured, and durability relied upon.

The following particulars may be advanced as characteristic of crystal gold, entitling it to favor.

1st. Its extreme softness.

Foil, rolled into coils or folded into tape, cut up, and then passed through a flame, as is necessary in order to develop fully its adhesiveness, becomes by this last process somewhat *stiffer* than before, and, when small cavities or minute retaining pits are to be filled, considerable trouble is found at times, in thrusting it *well home in the remote corners*, without cutting or breaking it.

Sponge gold, owing to its softness, can be carried without difficulty into the remotest and smallest crevice, can be left there easily, the instrument being readily detached, can be built upon, and a perfect filling secured, as well in a small as in a large cavity.

A second advantage of this softness is the certainty which the operator may have, that at every point throughout the entire plug, the gold is equally united. The material being fibrous, a more perfect union is effected with the same labor, than when the filling is composed of larger integral parts.

Two kinds of flour will unite the more perfectly the finer they are ground, because more of the particles come in contact with each other. So in uniting pieces of gold. If the particles are entirely separated, as in the fluid state produced by heat, and then put together, the union is complete. If they are to be united in a cold state, then the finer the fibres the more of them are brought into contact, and the closer will be the union.

2d. A second feature in crystal gold is its *inherent adhesiveness*.

Sponge gold needs no annealing, piece by piece, in order to make it adhere.

When dry, it is, of necessity, adhesive. Its fibrous texture is the most favorable form for the development of the adhesive property.

This being so, the instruments used in packing it do not require as deep serrations as those for packing foil. And although the same instruments can be used for both kinds of gold during *nearly* the whole operation, the employment of such as have shallower serrations for putting on the finishing layers, when using sponge gold, leaves shallower instrument marks in the surface, and a perfect finish is much more readily obtained.

3d. A third advantage is the saving of time. When speaking of this on a former occasion, I was misunderstood. I was taken to mean that all the time which I said was saved was gained by *the quicker insertion of the gold*. I did not so state. I will now be more explicit.

The time which is consumed in cutting sheets of foil into strips, rolling them, and then cutting them into pieces previous to inserting any in the cavity, is saved,—sponge gold requiring no cutting or folding. Again, the time consumed in seizing the tweezers, grasping the piece of foil and passing it through the flame, is saved,—bits of sponge gold being torn

from the mass, and carried directly to the cavity with one motion and one instrument.

If a close calculation is made, it will be found that from one-quarter to one-third of the time spent in building up teeth is lost in the two ways I have mentioned. All this time is saved by using sponge gold.

More than this, as I have before said, the filling is finished in less time than foil fillings.

4th. The last advantage which I shall name is this: A filling made of sponge gold is more dense than one of foil.

This assertion is proved by the fact that more gold in this form can be inserted in a cavity than in the form of foil, in which position I shall be sustained, I think, by several gentlemen of this Association.

Thus much for the excellencies of crystal gold. Now, a word of caution. Let no one commence the use of this material in the expectation that thereby the work of filling teeth is to be made easy. Care and labor are indispensable, whatever form of gold is employed. Nor will any material, or any form of material yet known, supply the want of these. Improvements and changes in material are designed to secure better results, not greater ease. Sponge gold requires labor and care and attention as well as foil. Nor can perfection be attained without them.

Force is necessary to pack gold of any kind. To pack it right, *skill* is requisite. To secure the preservation of the organ, *thoroughness of preparation* is indispensable. No filling will save a tooth improperly or imperfectly prepared. Crystal gold, upon a dead and corrupt pulp, possesses no charm to prevent ulceration. Its use will not justify carelessness. Nothing will justify it.

Thoroughness, gentlemen, in the employment of any material, in the performance of any operation, is essential to success.

Being thorough, we may bend whatever form of material we choose to our will, and compel it to do us service.

Lacking thoroughness, nothing we undertake will be creditable to ourselves or useful to others.

OPENING ADDRESS.

BY A. HILL, D.D.S.,

President of the Connecticut Dental Association.

GENTLEMEN:—The interval of our separation has elapsed, and we are brought together, in accordance with our preconceived plans, to inaugurate, in a more formal manner, the State Dental Association of Connecticut. I greet you on this occasion with much pleasure, and beg to congratulate you on the cheering auspices under which we are permitted to assemble.*

* The remarks of Dr. Hill, in reference to the rebellion and its suppression, we heartily indorse, but are compelled to omit for want of space.

As individual members of an honorable profession, it is fair to presume that we have accorded to us, by the community in which we live, our appropriate status, and that we each of us wield the influence to which we are justly entitled.

But what shall be the character of our association? and what can we do for each other and the public around us? These are questions which address themselves to us on the present occasion with great pertinence and fitness.

Shall our organization become a mutual admiration society merely, or shall we lay broad and deep the foundations of an honorable structure, that shall wield an influence for good when we shall have passed away, as our fathers have gone before us?

I trust that a mere ephemeral existence will not satisfy the purposes and designs of those who are present to-day, and who may unite in the organization and working of this association.

While it does not become me to *dictate*, it may nevertheless be appropriate to suggest.

Therefore, by your leave, I will proceed to make such suggestions as may befit my position as your *first* presiding officer and the circumstances of the present occasion.

To save us from disintegration and dissolution there must be a *common interest*, and *that* interest must be *perpetual*.

We shall find this interest in our *mutual improvement*, if we do not withhold our individual contributions to the common stock.

Now, there *may* be *individuals* who could get along very well without the aid of such associations, but I should do no injustice to such if I should say that no *one* man knows *everything*. And he must be a very dull scholar who cannot learn some valuable lesson from an inferior mind.

It is the aggregate of little things that constitute the great mass, and if every member of this association will contribute his mite, it will be found that each of us shall carry hence more than we brought thither.

A single suggestion, a simple hint, is often of greatest value, especially where we are pursuing a course of investigation or experiment, and have come to a dead halt for the want of a simple hint, which some brother may supply.

I, myself, have been years in experiment to achieve a given result. With my mind awake, and quick to apprehend, I have seized with avidity the merest *shadow* of a hint, by which the whole field of thought has at times opened before me.

Now there are some things which we never can learn until we reach a given point in our mental operations. We must have the *susceptibility*, *even*, to make a hint available.

And coming together, as we will, each from his office or laboratory, with some special line of thought ever before us, it is but fair to presume

that while each of us may add to the common stock, all of us may be enriched as individuals.

The mind is always *quick* upon *those subjects that most deeply* engage our attention. How then is it possible, where so many are working in the same field, that we can spend a few days together, earnestly canvassing the same subjects, without deriving a marked advantage?

Another great object we should ever have in view in our meetings should be the *public good*. The great end of life is not self-aggrandizement.

He who never gets out of himself knows not what it is to live. We *best* serve ourselves when we are serving others well. Our object should be to make the *most of ourselves* by enlarging the scope of our own lives.

And thus it will always be, that while we are nobly and heroically working for the public good, by a reflex influence, as certain as the law of gravitation, we are lifted up into a nobler sphere of individual existence. This thought should ever save us from mean and petty jealousies. If a worthy brother can outstrip us in the race for personal eminence and distinction, let us not try to pull him down to our own level, but bid him *God-speed*, and push on after him as fast as we may.

In coming together on such an occasion, let us lay aside our *green* glasses, lest we should come to think that all around us are *green*. In other words, let us disabuse our own minds of prejudice, which will never permit us to do justice to another, especially a professional rival.

For one, I can most truly say I desire to make myself rich in *all* useful knowledge. And although I have labored with some degree of assiduity to practice my profession worthily, I have never confined my studies or pursuits to the practice of dentistry alone.

And in my intercourse with the profession I have found that such is the case with not a few. The by-paths of science are always open and inviting, and the mere title of dentist should not be regarded as a complete synonym for one who knows nothing outside of the curriculum of dental operations.

Scientific pursuits are always ennobling. And dental science is kindred to medical science, and medical science intermeddles with *all* knowledge.

One object should be to round out our characters by the ennobling pursuits of all kindred sciences. *Truth is one*. A truth on *one* subject is in harmony with truth on *all* subjects. And when we strike *one grand truth* we have the *key-note* of all. Let us have courage to follow wherever truth may lead the way, and we shall always be safe.

Our association contemplates the development of truth as it exists in *dental science*. And we have before us an important field, already "white to the harvest." We come hither as *reapers* and *gleaners*.

In some respects we reap the fruit of those who have toiled in this field before us, and have sown broadcast around them the precious seed which now waves as a golden harvest.

In other respects we are *pioneers* and *explorers* in a field of undeveloped thought. We are following a "lead" that will open up a new mine of professional treasures.

Some of us come as *gleaners*, picking up the precious grains which have been left unnoticed by others. We are what the great bard of Avon calls

"Snappers up of unconsidered trifles."

But let our relative position be what it may, there is work enough for us all. And I may add

"Ample scope, and verge enough."

We do not *all* excel in the *same* specialty. We do not *all* feel equal interest in the *same class* of operations. Our peculiar genius and habits fit us for some *one class* of operations better than another.

Some can scarcely endure the *laboratory*. They prefer the operations of the *chair*. Others, following the bent of taste, as of inclination, prefer *dental mechanics*. And this is well. Let each one follow the department best suited to his taste, and he will find that in such a sphere he will surely win distinction.

But in our association we bring together our various contributions, and we are all enriched together. In coming together thus, bringing with us the results of our varied experiences, and in the true spirit of professional courtesy and brotherhood, *one* result must certainly follow, to wit: the elevation of our profession, as a whole, and our own individual status. But in order that we may reap the full benefit of this association let me make this suggestion, viz.: *Don't be in a hurry to go home. Let us take time to compare notes. To compare notes fully.*

It is no small matter for a body of dentists to get together as we are here this day. And it would be most unwise to lose the benefits of our meeting for the want of *one additional* day.

To give interest to our meetings, and dignity to this Society, it is quite important, it seems to me, that our archives should be enriched with *elaborate papers* on different branches of dental science. I would therefore suggest that provision be made to secure such at all our subsequent gatherings. These, together with *stenographic* reports of our discussions on the various topics propounded by the executive committee, would add greatly to the value of our associations.

Another subject has occupied my thoughts for some time past, which I will venture to name for your consideration.

Why should we not have a *Dental College* in *New England*? Why should we not have one in *Connecticut*?

Why must all our young men from the British provinces in the east, and all this large territory, embracing the New England States and the Canadas, be compelled to go to *Philadelphia* or *Cincinnati* to secure the advantages of a dental collegiate education? Have we not within

our State one of the most renowned and excellent seats of learning in this country? And why may we not attach a dental department to venerable old *Yale*, and thus challenge the consideration of young men throughout the country?

Let us consider these interrogatories.

I am still on the hither side of fifty. Nor can I realize that I am even *near* half a century old. And yet the grandest developments of dental science have occurred within, not the period of my *life merely*, but within the period of my *professional history*.

Some thirty years I have been engaged in dental practice, and within that brief period I have marked the organization of the first national dental society in America, if not in the world.

About twenty-five years ago, a company of distinguished dentists met in the City of New York in convention, and resolved to organize a society. A committee was appointed to draft a constitution, of which Dr. Vernon Cuyler, of this city, (Hartford,) was a member. And thus originated the "American Society of Dental Surgeons," composed of some of the most distinguished dental practitioners.

I ought to say, perhaps, that there was a dental society previously existing in the City and State of New York, but none of a *national character* prior to this period.

About the same time the "Baltimore College of Dental Surgery" sprang into existence—the *first* institution of the kind.

Not far from the same period the first number of the "American Journal of Dental Science" was published, edited by C. A. Harris, of Baltimore, and Eleazor Parmly, of New York. And thus sprang up a *literature* the value of which cannot now be estimated.

I love to think of those fathers in the profession upon whose steps I, then a mere boy, waited with reverence and delight. I can but feel proud that it was ever my pleasure to know, and personally converse with such men as Horace Hayden, Chapin A. Harris, and others of Baltimore. With L. S. Parmly, of New Orleans; Elisha Baker, Eleazor Parmly, Solyman Brown, and other distinguished practitioners of New York City; with Gardette, Townsend, and others of Philadelphia; with Maynard, of Washington; Flagg, of Boston, and other names of marked distinction.

And I well remember with what *trepidation* and fear I appeared before a committee of the "American Society" at Boston, to be examined for membership in that society. But the committee, of which Drs. Harris, of Baltimore, and Eleazor Parmly, of New York, were members, made a favorable report, and I was admitted to membership. And a certificate of membership, signed and sealed by the officers of that society, I hold at the present time.

But these fathers in the profession have many of them passed away, and it is sometimes a question with me whether their equals in all respects remain. But the beautiful words of Longfellow are still appropriate:—

"Lives of great men all remind us
We can make *our* lives sublime;
And departing, leave behind us
Foot-prints on the sands of time."

Gentlemen, let us labor to this end. Let us leave such "foot-prints" behind us, that those who come after us shall feel that we have not lived in vain.

Perhaps I should apologize to you for detaining you so long from the business of this Convention, by my desultory and somewhat incoherent address. But, throwing myself on your indulgence, I beg to express my fervent desire that we may live to see this Association eminently successful and prosperous.

STEAM PRESSURE IN VULCANIZERS.

BY ALFRED WELCH.

I HAVE been interested in reading an article in the DENTAL COSMOS for May, from A. Lawrence, on "Steam Pressure in Vulcanizers." I am glad the article was read before the Dental Association of Massachusetts, and now is published in the DENTAL COSMOS. I hope the desired effect will be produced throughout the profession, and that an irresistible demand will be made for vulcanizers that may be considered perfectly safe.

According to the showing of Dr. Lawrence, by an increase to about double their present thickness, and the introduction of the steam gauge in place of the very unsafe thermometer, we might rely with some degree of confidence on having head and limbs at the close of the vulcanizing process for further work.

I must confess to having felt a little afraid from the first, every time I have used these thin thermometer vulcanizers, especially so, since the bursting of one of Whitney's in our office at Wenona not long since. A slight oversight only was the occasion of that terrible explosion. Lucky, indeed, that my brother, and a lady patient in the chair at the time, were not both sent "kiting through the air, taking an aerial journey," as Dr. L. has it, "at the expense of all earthly ties." Fortunately no one was hurt, though the top of the vulcanizer was blown through the ceiling, knocking off the shingles of the roof above. The flask was blown to flinders—part of which, with the plate of teeth, was sent through the wall, and probably fell down between the joists. One thing is certain, we never could find a vestige of the teeth afterward.

The intention of this writing is to contribute a little influence toward an *overwhelming demand* for safe vulcanizers. The makers would probably make money by the change; for what dentist would not gladly throw away his unsafe one and buy a new and safe vulcanizer?

ROCHESTER, MINN., May 30, 1865.

PROCEEDINGS OF DENTAL SOCIETIES.

HARTFORD SOCIETY OF DENTISTS.

BY C. M. HOOKER.

A MEETING of dentists was held at Hartford, Conn., June 12th, 1865. Drs. McQuillen, of Philadelphia, and Atkinson, of New York, were present.

Dr. E. E. Crofoot was chosen Chairman, and C. M. Hooker Secretary.

Dr. McQuillen having been requested to address the meeting, said that when accepting the invitation to be present this evening, he had not anticipated the pleasure of meeting so many of his brother practitioners in the good City of Hartford, with only 35,000 inhabitants.

A few years back many cities in the country, with ten times the population, would not have been able to have assembled, even with the most strenuous exertions, so large a number of the profession; but an increased liberality of sentiment, and a disposition to fraternize, prevail throughout the profession generally, and, as a consequence, dental associations are being formed in nearly every State and city of the Union. The recognition of this fact, and of the importance of aiding and encouraging all such efforts, was so deeply impressed upon his mind, that however pleasant it might be for him to address them upon any scientific or practical subject connected with the profession, he felt that the limited time they should remain together could be much more profitably spent by them in devising some plan by which a dental association could be established in Hartford.

He knew that some efforts had been made in that direction, and from what he saw of the spirit manifested this evening, felt confident it was only necessary to take the first step toward an organization, and the effort would prove successful. The advantage of associated effort to the individual practitioner, to the profession, and to the community, was briefly referred to in conclusion.

Dr. Atkinson then, in his usual vigorous style, urged the necessity of associated effort, and the duty each member of the profession owed to himself, and the progressive spirit of the age, to give freely of whatever talents God had intrusted to his keeping, as a means of still elevating our noble profession, which at present deserves equal rank with the medical profession.

The following persons were then appointed a committee to draft a constitution and by-laws:—

Drs. J. M. Riggs, Jas. McManus, C. M. Hooker.

At a subsequent meeting the committee made their report, which was accepted, and a permanent organization effected by the election of the following officers:—

President, John M. Riggs; *Vice-President*, E. E. Crofoot; *Secretary*,

C. M. Hooker; *Treasurer*, Wm. Blatchley; *Executive Committee*, Jas. McManus, C. M. Hooker, Wm. M. Porter.

The meetings of the Society are held the first Monday evening in each month.

The Executive Committee reported, as the subject for discussion at their next meeting, (August 7th,) "Ulcerated Teeth, their Cause and Cure."

Dr. James McManus was appointed a delegate to the "American Dental Association."

CONNECTICUT VALLEY DENTAL ASSOCIATION.

BY L. D. SHEPARD, D.D.S.

THE semi-annual meeting of this Association commenced at Northampton, Mass., on Tuesday, June 13th, and continued through Wednesday.

Over thirty members were present. The President, Dr. O. R. Post, of Brattleboro', Vt., occupied the chair.

Secretary Shepard, of Salem, Mass., read his report of the last meeting, which was accepted.

Drs. Searle, Beals, and McManus were appointed a committee to examine applicants for membership. They reported favorably on the following, who were elected, and became members by complying with the requirements of the constitution:—

Dr. F. T. Murlless, Windsor Locks, Conn.; Dr. N. B. Welton, Cheshire, Conn.; Dr. H. W. Clapp, Westfield, Mass.; Dr. R. E. Strong, Easthampton, Mass.; Dr. L. E. Way, Lee, Mass.

Drs. J. H. McQuillen, W. H. Atkinson, and J. Taft were elected honorary members.

The first topic assigned—Irregularities—was taken up.

Dr. Searle, of Springfield, Mass., presented a model, and explained his manner of correcting the irregularity.

Dr. Shepard, of Salem, presented several models, showing the condition before and after treatment, and the appliances used in the several cases.

Dr. Bowers, of Springfield, Vt., presented a model, showing a very bad case of irregularity.

Dr. Atkinson spoke of the pleasure of meeting with earnest workingmen in search of truth. He spoke of the theory of irregularities and its correction. In all our efforts we must coincide with Divine laws. As nature does her work, so must we accomplish ours, namely, in the way most simple, most direct, and quickest; must also remember the law of development of teeth in pairs, which nature adopts. Hence, if it is necessary to reduce the number of teeth to correct the abnormal condition, must extract on both sides.

Dr. McQuillen regarded the interblending of the Celts and the Ten-

tons in this country as a cause of irregular dentures. In the first, the craniæ are oval, and the jaws in the form of an ellipsis; in the latter the craniæ are round, and the jaws form a perfect arch. Much has been said with regard to preventing the marriage of persons whose defective organisms would be transmitted to their progeny. The theory was good, but its enforcement was difficult.

He believed that the premature extraction of the deciduous teeth was another prolific source of irregularity; and directed attention to the fact that the use of a part develops it; and on this account we should keep the deciduous teeth, that the jaw, by their use, may be fully formed. Would advise the excising of exposed fangs in cases where they were a source of annoyance to the surrounding soft parts, rather than the extraction of the teeth.

Dr. Riggs, of Hartford, does not think so much importance should be attached to the preservation of the six-year old molars. Thinks in many if not most mouths their loss is an advantage, owing to the contracted development of the jaw. Would extract them if decayed or overcrowded in season to have the space filled up by the anterior and posterior teeth.

The discussion was very interesting, but our notes are not full enough to report the remarks of others. Of the regular essayists elected at the last meeting, Drs. McManus and Shepard were prepared. The former read a paper on "Diagnosis." He argued the importance of great care in correctly diagnosing; drawing attention to some of the difficulties, and presented cases illustrating the subject. The latter read a paper on "Popular Education," arguing that our best field for educating the public is in the office by personal conversation.

The second topic—"Mallet-Filling"—was opened by the reading of an essay by Dr. Atkinson. The discussion was continued through Tuesday and a part of Wednesday, and ended with a clinic by Dr. Atkinson, who filled a bicuspid for a member of the Association.

Dr. Meredith, of New Haven, read a volunteer paper on the "Past, Present, and Future of Dentistry."

The following were elected delegates to the American Dental Association, at Chicago:—

Drs. James McManus, W. H. Jones, L. D. Shepard, Geo. Bowers, J. Beals, N. G. Hale, A. F. Davenport, A. A. Howland, E. M. Goodrich, E. V. N. Harwood.

The third topic—"Causes of Decay in Teeth"—was discussed at length by a number of members. Space does not permit an abstract of the opinions presented.

Dr. Post announced the death of Dr. J. M. Pearson, a member of this Association. He was followed by Dr. Beals, and the accompanying resolution was passed:—

Whereas, we learn with sorrow of the death of Dr. J. M. Pearson, be it

Resolved, That while we bow with profound submission to the will of our Heavenly Father, we deeply deplore the loss of our highly esteemed professional brother and fellow-member.

Remarks were made by Dr. Searle on the death of another member, Dr. D. S. Colton, of Meriden, Conn., which were ordered to be entered on the records of the Society.

Voted that the annual meeting be held in Springfield, Mass., commencing on Tuesday, Oct. 31st, 1865.

In compliance with an invitation extended to him by the officers of the Association, on Tuesday evening Dr. J. H. McQuillen delivered an address on the "Anatomy and Physiology of Vision," in the Town Hall. In addition to the members of the Society, there was a large attendance of the public. It was a clear and comprehensive lecture, and contained much valuable information about the delicate organs of vision, with "practical hints" to dentists on the proper regulation of light in operating rooms, etc. The employment of diagrams in illustration of the *reflection* and *refraction* of light, and of its decomposition into *seven* prismatic colors according to Newton, and *three* according to Brewster; and of the *spherical* and *chromatic aberration of lenses*, with the means made use of to correct them, along with a number of large *papier-mâché* manikins, demonstrating in the most perfect manner the minute anatomy of the organ of vision, tended not only to enhance the interest of the lecture, but also to make the subjects treated more easy of apprehension and indelible of remembrance on the part of the audience.

Votes of thanks were passed to Drs. McQuillen and Atkinson for their attendance and words of instruction; to Drs. McManus, Wolworth, and Shepard for their essays; and to Dr. Jones, of Northampton, of the executive committee, for his arduous labors in preparing for the meeting, and providing the necessary conveniences.

Wednesday morning, as already stated, was devoted to clinical demonstration. While this was in progress, and afterward, "Mallet Filling," "Dental Caries," and other subjects were discussed.

At four P.M., on Wednesday, we adjourned, having spent a couple of days together very pleasantly and profitably.

SALEM, MASS.

INDIANA STATE DENTAL ASSOCIATION.

BY J. F. JOHNSTON, D.D.S.

THIS Association met on the last Tuesday in June, 1865. Quite a large number of the profession were present, and a very interesting and instructive session was the result.

The officers for the ensuing term are : *President*, Dr. Joseph Richardson, Terre Haute ; *1st Vice-President*, Dr. P. G. C. Hunt, Indianapolis ; *2d Vice-President*, Dr. C. C. Burgess, Indianapolis ; *3d Vice-President*, Dr. P. W. Morris, Greensburg ; *Corresponding and Recording Secretary*, Dr. John F. Johnston, Indianapolis ; *Treasurer*, Dr. G. A. Wells, Indianapolis. Delegates to American Dental Association : Dr. D. M. Weld, Terre Haute ; Dr. C. C. Burgess, Indianapolis ; Dr. M. Wells, Indianapolis ; Dr. Joseph Richardson, Terre Haute ; Dr. P. G. C. Hunt, Indianapolis.

Essayists for the next meeting : Drs. D. M. Weld, C. C. Burgess, and M. Wells.

In consequence of no reporters being present, it is quite impossible for the Secretary to give to the profession that which would be most valuable to them, viz., a report of the discussions. It is hoped that at the next meeting this omission will be provided for.

Preferring not to annoy either the journals or the profession with dry business details, the Secretary will only add, that he thinks the profession in Indiana will find it to their advantage to give more particular attention to the interests of their State Association than they have done heretofore. He is happy, however, to announce that the Association is now upon a permanent footing, and from the great interest manifested by those present at this meeting, he predicts a very full attendance at the next, which will take place at the City of Indianapolis, on the last Tuesday in June, 1866, and to which the profession throughout the State in particular and any others that can come, are cordially invited.

CENTRAL NEW YORK DENTAL ASSOCIATION.

BY CHAS. BARNES, D.D.S.

THE Central New York Dental Association held its annual meeting at the office of Dr. Harris, in Skaneateles, June 20th.

The following officers were elected for the ensuing year :—

President, S. G. Martin ; *Vice-President*, P. Harris ; *Recording Secretary*, Charles Barnes ; *Corresponding Secretary*, Charles L. Chandler ; *Treasurer*, F. G. Tibbetts.

Drs. C. H. Forman, Charles Barnes, S. B. Palmer, Chas. F. Campbell, and Chas. L. Chandler were appointed essayists for the next meeting, to be held in Syracuse, December 19th.

Delegates to the American Dental Association : Drs. J. B. Palmer, S. G. Martin, Chas. Barnes, and John E. Savery.

EDITORIAL.

SALUTATORY.

IN entering upon the discharge of new duties in connection with this magazine, the request to do which on the part of the publisher was entirely unexpected to me, it is my earnest wish that the DENTAL COSMOS shall continue to be a *live* journal, and give such decided manifestations of vitality, that it may be truly said not only to constantly represent the advanced science and art of the profession, but also to be in a large degree instrumental in effecting that result. Recognizing that work such as this to be properly accomplished demands the most varied talents, attainments and experience, and that these can only be secured by enlisting the *sympathy* and *aid* of the *live* and *thinking* minds of the profession, I cordially invite those who may feel inclined to accept such offer, wherever they may be, whether enjoying the advantages of constant intercourse with their fellow practitioners in large cities, or cut off from such stimulus to exertion by the isolation of country practice, to come forward and assist me in the discharge of this responsible though pleasant duty, by contributing freely to the pages of the magazine.

An extended intercourse with my professional brethren, either in person or by letter, has long since taught me that there is scattered all over this country a latent and powerful talent, which has never yet been heard from, but that is capable of doing much toward placing and maintaining our specialty truly and firmly on a level with other liberal professions. Many of this class are men of ripe judgment and extended experience, who having been engaged for years in successful practice, highly creditable to themselves, and eminently serviceable to their patients, have thereby gained a vast fund of practical knowledge, the impartation of which to their younger and less experienced fellow practitioners would be of great value to them. Another portion of this class are young men of a superior order of mind, who, by close and studious application, have made themselves familiar, not only with the science of our profession, but also with the collateral sciences. A natural diffidence on the part of some, an impression, on the part of others, that they have not had time to engage in literary labors, and other causes, have prevented these parties from contributing heretofore to our periodicals, and thus the *onus* of labor has fallen upon a few earnest workers. We are living, however, in a period when every educated man is not only expected to provide for the material wants of himself and those dependent upon him, but, in addition, to contribute his share to the aggregate of knowledge gained through the exertions of those who have preceded or are cotemporary with him. Let the old and experienced practitioner, therefore, impart freely his lessons of practical knowledge, with the assurance that he will never have reason to regret it, and let the fact of having profited by the discoveries

and contributions to science of others be but an incentive to the young practitioner to endeavor to add some new truth to the large field of science with which he has become familiar.

As I remarked years ago, and the same thing is equally true to-day, "The present wants of the profession demand a more extended range of subjects than has generally prevailed heretofore. To meet this, in addition to communications from occasional contributors, there should be connected with the magazine a corps of collaborators, each of whom, conversant by systematic study with the general and collateral science and art of the profession, should select and confine himself to a special department, *instituting experiments and investigations*, and *carefully describing* the results in a regular series of articles. Thus either anatomy, physiology, chemistry, principles of dental surgery, operative dentistry, or mechanical dentistry, if made a special object of study, and prosecuted with vigor and perseverance, could not but act favorably upon our literature and be the means of disseminating valuable information and correcting many erroneous views." The reliable additions made to science by German, French, and English observers have been accomplished by such *concentration and devotion* of purpose to a given field of investigation.

The gigantic rebellion, which during the past four years deluged our beloved country with precious blood, and proved so destructive to life, property, and happiness, very naturally prevented many who fully recognized and keenly felt how much there was at stake, for the present and the future, in the terrible arbitrament of arms, from giving that entire devotion to the cultivation of science which would be natural to them in a more peaceful period. The happy termination of the struggle now opens to our country a brilliant future, in which every department of science, of art, and of trade will be entered upon with increased energy and devotion, to be followed by proportionate results. In these efforts the science and art of dentistry will bear no mean part.

There can be no just reason why a magazine conducted upon such principles as those suggested above, and meeting in every respect the *wants* of the profession, should not be self-sustaining, for every dentist that desires to be prepared for all the emergencies of practice, and to keep even with the age, must peruse regularly at least one good dental journal; and each physician that would thoroughly appreciate the relations the teeth bear to the general health of individuals, and their influence in developing sympathetic derangements, can not find a more certain and reliable medium for obtaining such information than from the same source.

In conclusion, desiring for the benefit of the profession and of science generally that I may have the good fortune to secure the hearty co-operation, not only of those who have been long and usefully engaged as contributors, but in addition those men of ability referred to as unknown to the profession, I shall endeavor to discharge, to the best of my powers, the responsible duties which I have been called upon to assume.

A MERITED COMPLIMENT.

AT a silver wedding of Dr. William H. Atkinson, which took place during the month of May, in addition to a number of *souvenirs* from different professional and other friends, a beautiful set of silver was presented to him by several members of the BROOKLYN DENTAL SOCIETY, as an evidence of their appreciation of the valuable services rendered by him in inducing a greater liberality of sentiment, a more earnest desire for self-improvement, and a higher order of practice than had generally prevailed with the dental profession of New York in former years. Recognition such as this is as highly creditable to the donors as it is justly merited by the recipient of the gift. One can appreciate the change which has been effected, by contrasting the mental activity *now* manifested by the members of the two dental societies of New York, with the entire absence of anything like associated or professional intercourse which formerly prevailed there. This becomes still more evident on visiting the city, and meeting with the members of the profession. Speaking from a personal experience in this respect, and recalling how, only six years ago, when endeavoring to arouse the profession of that city to the importance of assisting in the establishment of a national association upon a representative basis, first by addressing letters to a number of professional gentlemen, and then by personal intercourse, in which it was stated by them that there was no local dental society in the city,* and no prospect of the establishment of one that would be at all useful or creditable to the profession, and then witnessing the decided revolution which has been effected in such a short period, the contrast is made the more forcibly apparent to me.

I should do injustice to others who have been and still are earnest workers in that city, and also to Dr. A., by creating an impression that this change has been accomplished entirely through the exertions of a single mind; but that it has been largely due to the fact that in that was the ferment, "the *leaven* that leaveneth the whole lump," will be admitted by all who are familiar with the subject.

J. H. M'Q.

ANNOUNCEMENTS OF THE BALTIMORE AND OHIO COLLEGES OF DENTAL SURGERY.

THE annual announcements of these two institutions have been received, and a radical change in the faculty of each is presented. In the Baltimore College those veteran teachers, Professors Bond and Austin, whose

* This statement was not correct; there was a dental society at that time, but it was in a state of *dormant vitality*.

capacities are so well known to the profession, have associated with them as colleagues Professors Gorgas and Aikin, and Drs. Keech and Waters as demonstrators of operative and mechanical dentistry.

The faculty of the Ohio College, with Dr. James Taylor as Emeritus Professor of Institutes of Dental Science, is composed of the following gentlemen: Professors Spaulding, Kearns, H. R. Smith, Watt, and Taft, with Drs. Walter, Van Marten, and Taft as demonstrators of operative and mechanical dentistry and of anatomy. The profession in general will hail with pleasure the advent of Professors Spaulding and Watt. The first entering upon new duties, which his training as a close student, and lengthened experience as a thorough practitioner admirably fit him to discharge with advantage to the class and credit to the institution. The second returning after a respite of a few years to a field in which he labored long and faithfully, and with marked success as a teacher.

In addition to these schools, and the two in Philadelphia, a charter has been granted for the establishment of another in New York, which is expected to be in successful operation this winter. The suggestion has also been advanced by Dr. A. Hill, of Norwalk, in an address before the CONNECTICUT STATE DENTAL ASSOCIATION, to establish a dental department in connection with Yale University, at New Haven, and a similar proposition has been presented by Dr. N. C. Keep, in an address before the MASSACHUSETTS DENTAL ASSOCIATION, favoring such a movement in connection with Harvard University at Cambridge, Mass.

Satisfied that all efforts such as these, if successfully carried out, tend to increase the avenues whereby dentistry can alone be placed upon a level with other liberal professions, I most heartily commend and indorse such efforts, and feel assured that every liberal-minded man in the profession will do the same. If every one engaged in the practice of dentistry who needs instruction, or those students who expect to enter upon practice, would attend, as they should, the dental colleges, the accommodations at present afforded would not be sufficient to meet the demand. As it is, there is *work* enough and *room* enough not only for those already established, but many more, and there can be no question that a fair measure of success will attend the efforts of those who, by thorough and persistent devotion to the great cause of education, shall prove themselves worthy of the confidence of the enlightened and liberal members of the profession. Such efforts are not only more commendable, but also likely to prove more advantageous than to depend upon attempts to disparage the efforts or traduce the honor of others engaged in the same field of labor. The latter course, like the Australian boomerang in the hands of an inexperienced warrior, is more likely to injure in the rebound the one who employs it, rather than those whom it is aimed at.

J. H. M'Q.

CORRESPONDENCE.

LETTER FROM PROF. RICHARD OWEN.

THE accompanying letter from Prof. Owen, in reply to a notice of his election as an HONORARY MEMBER of the ODONTOGRAPHIC SOCIETY of PENNSYLVANIA, is published on account of the deep interest which the greatest living naturalist of the age, as he is justly regarded, manifests in that department of science a thorough knowledge of which is indispensable to sound practice on the part of the dentist. It is not necessary to dwell upon the valuable contributions which his genius and industry have made to odontology; for the eminent and valuable services rendered in this direction are well known to the profession and the world of science, and that noble work, "Odontography," will survive as an enduring monument, perpetuating his memory among men of science and of letters, long after images of marble or of stone shall have crumbled to the earth. This great work contains a record of exact, varied, and extended research, with which every dental *student* should become familiar; the high price, however, precludes the possibility of every one being able to purchase a copy, but each dental society should make it a *sine qua non* to have it in their library, so that the members may enjoy the opportunity and privilege of studying its pages and examining the beautiful and instructive illustrations of the different microscopical appearances presented by the dental organs of the *vertebratæ*, recent and extinct.

The letter was sent to me under the care of Dr. Norman W. Kingsley, who, in his recent visit to Europe, carried to Prof. Owen his notice of election, and certificate of membership with the Society.

SHEEN LODGE, RICHMOND PARK,
May 15, 1865.

J. H. MCQUILLEN, M.D., D.D.S.

DEAR SIR:—Favor me by conveying to your "ODONTOGRAPHIC SOCIETY" my most respectful and cordial acknowledgments for the honor they have been pleased to confer upon me, by electing me an honorary member of the Society.

I take particular interest in the developments of the science of odontology in all its relations, and especially its practical applications to human needs. They are associated in my mind with some of my earliest and most agreeable researches, and it is a peculiar pleasure to be in the memory of fellow-laborers pursuing similar investigations.

With every good wish, believe me,

Faithfully yours,

RICHARD OWEN.

P. S.—I regret that Dr. Kingsley's stay in our metropolis is too short to enable me to have the pleasure of showing, as I could wish, the high esteem I have for his ingenuity and attainments.

R. O.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Death and Life.—Extract from the “Renewal of Life,” and Clinical Lectures, by T. K. CHAMBERS, M.D., etc.—“Before I enter, as a teacher of clinical medicine, upon my duty of showing you how to read the lessons which are spread out before your eyes in the hospital wards, it is my custom to give you an introductory lecture. I think this saves time in the end, for ‘*claudus in viâ antevertit cursorem extra viam*,’ as Bacon tells us, and my object is to show you the way. Doubtless all your past professional studies have been in a manner introductory to this crowning study; your anatomy, and chemistry, and physiology, and the systematic principles of medicine learned under me and my colleagues, have led up to this end. But I wish shortly to recall to your memory what points in those studies of life and death have the most special bearing on the matter in hand, and to show how a consistent theory of therapeutics may be built up from them.

“It is true that there are, and always have been, practitioners who declaim against theories altogether, who even boast that they can do without them, and think them useless, not considering that to express such scorn is as if we should be proud of not knowing what we do when we act, or what we say when we talk. To reason at all is to theorize; no one without theorizing can direct a method of cure to a sick person except at haphazard. As a matter of fact, none of these objectors ever do prescribe without theorizing about either the individual sufferer or the class to which they refer his sickness, though not always able to put their theory into words. In short, the want of a guiding principle to connect the loose facts of daily experience has at all times been felt.

“From this practical need have been bred the many systems of therapeutics stamping their mark from time to time on the history of our art. They have sprung from the brains of working men at the bedside, not from philosophers in their closets. Their adopters have not necessarily any strong faith in their truth or universal applicability; but the heart wearies for a chain to link together the scattered fragments of knowledge—a string for its pearls; it must have an idea on which to codify the laws of action.

“It would be a long task to quote the curious systems founded on imperfect data, but numbering their hosts of followers in former ages, which have been given up as false and dangerous: I do not wish twice to slay the slain. I shall content myself with putting before you that which influences me in my practice, to which I now proceed.

“Man’s body may be likened to a stately mansion, made of beauteous but very perishable materials, all of which are always needing repairs to keep up the shapeliness and usefulness of the building. But not all in equal degrees; some of the walls may stand unaided for years, while other parts may want almost hourly looking after. When the owner leaves the dwelling the repairs cease, and then we see, not all at once, but one after another, the materials falling into ruin. It will serve a purpose in my argument to think over the several steps of this ruin for a few minutes.

"Already while the soul is withdrawing we know that changes begin, very obvious to even the most superficial observer. These changes are mostly due to the loss of water by evaporation. The eyeball loses its brilliancy and gets dry and flat, the features shrink, the gloss leaves the hair and skin. All this goes on all the more rapidly after decease, and then we hide our dead out of our sight, and the future fate of the body is less familiar to us; we must search for exceptional cases or special observations if we want to know what happens. These we may cull from sundry independent sources. Here is one which old barbarous manners afford us. 'Rizpah, the daughter of Aiah, the concubine of Saul,' watched for six months, from 'the beginning of barley-harvest,' in April, to the rainy season in October, 'till water dropped upon them out of heaven,' to guard the corpses of her murdered kinsmen from the beasts of prey. So long under the sky of Palestine did they hold out a quarry for the wild dogs and vultures.

"In a moister air decay is quicker, but still not so quick as is often supposed. Here is another observation redolent of the refinements of modern science. The notes made by M. Devergie* on the bodies at the Morgue at Paris, show that for two months and a half after decease the muscular structures still keep their natural forms and hues. Up to three months and a half, the scalp, eyelids, and nose so far retain their ordinary features that the age of the person may be told. It is four months and a half before complete destruction of the face occurs, or the bones become brittle, and the bulky muscles of the neck and thighs are converted into adipocere. So that we may call three months and a half a short time to be occupied by the decomposition of a human body. So long does flesh last as flesh, and tissue as tissue, and is not melted into its mother earth.

"Let us come forth quickly from these ghastly scenes of the charnel-house to the joyous bustle of brimming life, and ask how long it takes not a dead but a living body to decay? '*A living body decay?*' Yes, in truth; but whereas in the former case it was a thing to make men shudder, the fading of a long-loved image, the tearing up of a fair garment, the fall of a darling home, the violation of a worshiped shrine, the forcible divorce from our nearest and dearest—it is all this and more—in the latter it is associated with the fullest fruition of all that is joyous in existence, the bounding pulse, the free-drawn breath, the swelling chest, the thrilling feel of health, the highest uses of mind and body. Decay is more truly a part of life than it is of death; for it goes on unstayed through the whole of corporeal being; whereas, after dissolution, it gradually ceases, and ends its work with the reconversion of the organic particles into eternally changeless elements. The most living body is the most active in decay: the more bodily and mental vigor are displayed, the more quickly do the various tissues melt down into substances which are without delay removed by the excreting organs. The more the blacksmith toils with his arms, and the more the statesman with his brain, the heavier bulk of carbon, nitrogen, oxygen, and hydrogen is thrown out by lungs, liver, skin, and kidneys. Do they then wear out by this constant use, friction, and drain? No, no—the more bricks are removed from the old wall, the more new bricks will a good builder put in; and so—provided that the supply is sufficient, and that the builder is a good one—the more rapid the drain—the newer and stronger and fitter for its uses will the body become.

* Devergie, "*Médecine Légale*," t. ii. chap. v.

"But I will leave generalities and try to represent in figures how long it takes by living decay for the living body to drain away, and to have its substance renewed. In the grim details which I recalled to your memory at the beginning of this lecture, the nitrogenous or fleshy parts were most accounted of and especially named as giving shape and the general look of a man to the melting corpse. So of the nitrogenous parts we will now speak—How long are they in being removed by vital decomposition?"

"We may reckon with Drs. Bidder and Schmidt* that the body of a mammal contains 35.45 grammes of nitrogen per kilogramme; and, therefore, that an animal of 130 lb. (which is the mean weight of a man) contains upwards of 4.6 lb. of nitrogen.

"Then again, taking our numbers from an equally sound and independent source, we may reckon with Baron Liebig† that the liquid and solid excreta of a man by kidneys and bowels for a year contain 16.41 lb of nitrogen, or for three months and a half 4.7 lb of nitrogen.

"That is to say, in three months and a half a quantity of nitrogen is removed by excretion, or vital decay, equal to the quantity of nitrogen in the whole mass of the chief nitrogenous tissue.

"What attraction has this term three months and a half for us?—what memories does it rouse? Why, this was the very time we fixed upon for the fleshy framework of the corpse to melt away in. Here is a pregnant fact, a light thrown on the mysteries of nature from a most unpromising source! Dead flesh and living flesh last as nearly as possible the same time—the former, if anything, rather the longer. As far as we can judge, the albumen, fibrin, gelatin, etc., which make up the live body, differ in nowise from the same matters dead; they are liable to the same changes, affected by the same reagents, and naturally are resolved into their elements in the same time; just as the marble in the Apollo Belvidere is to a mineralogist the same stone as it was in the quarry, liable to the same accidents and possessed of the same properties, though temporarily endowed with a different value, and made god-like by its adventitious form

"What, then, raises to the rank of living creatures, and clothes with loveliness the masses of organic matter which are growing, moving, breathing, thinking, all around us? It is the power of the individual Life to create its own individual Form. A man has no right of property over the particles of his body, except so long as they remain particles of his body and retain his shape. He hardly calls *his* the snappings of his hair or the parings of his nails, much less the carbonic acid he exhales from his lungs or skin; all that he throws off is by common consent claimed as a perquisite by the public; and the battle-fields which he has fertilized with his blood enrich, not him, but the peaceful farmer. Yet as long as these organic constituents retain the form impressed upon them by the individual life, they are more truly his than any portion of his inheritance.

"A conjectural theory has been hazarded that life mysteriously endows living matter with a defensive virtue, which enables it to resist the chemical and other powers acting regularly on inorganic and dead matter. The most notable instance cited is the stomach, which digesting everything else is not itself digested. This consumer of flesh is itself made of flesh, yet is not consumed. An answer seems given to the witty philosopher,

* "Die Verdauungssäfte und der Stoffwechsel," p. 400.

† Liebig's "Chemistry of Agriculture and Physiology," part i. chap. ix.

who on hearing an alchemist boast his discovery of an universal solvent, inquired 'In what vessel do you keep it?' The stomach says, (it has been in the habit of saying wise things from the time of Menenius Agrippa,) 'In a vessel like me, which is destroyed indeed continuously, but is continuously rebuilt.' Recent researches show that living matter, such as parts of living animals swallowed for instance, is dissolved by the gastric juice, and moreover that its own epithelial coat is destroyed, but is immediately replaced by a new one. By this activity of growth, (the idea of the impudent members calling the belly lazy!) and by a constantly flowing supply of alkaline blood to neutralize any of the acid secretion which might penetrate too deep, it retains the same shape for threescore years and ten. But it has no privileged immunity against the solvent it makes.

"It is, then, the Form which constitutes the Self; and it is not the changing, decaying matter which 'was mine, is his, and may be slave to thousands.' The organic materials are the property of the form only so long as it retains them, and no longer—they are a floating capital. Over the innate essential nature of the material it has no control. Life cannot make the brute materials which it uses live longer than that which it leaves unused, but it has the power of making them anew, and building them up into a certain shape for the time they are made to last. In short, Life rests on the metamorphosis or Renewal of the body; as this renewal is more thorough, the individual is more perfect, and fulfills better and more completely the duties of its position. If it stops altogether, the body is no longer living. If it partially stops, the order of normal phenomena is disarranged, and ease is expelled—there is a state which we call '*dis-order*' or '*dis-ease*.'

To speak, therefore, of a 'superabundance of life,' or of an 'excess of vital action,' is a contradiction in terms. There cannot be too active a metamorphosis of the tissues, for the fresher their organic constituents, the more serviceable they are, and the longer duration they have before them. There cannot be too close an adherence to that typical form which it is the business of metamorphosis to keep up, any more than there can be too exact an obedience to law and order."

(To be continued.)

*"Operations on the Jaws.** By WILLIAM FERGUSSON, F.R.C.S., F.R.S., etc. etc. Lecture delivered at the Royal College of Surgeons of England.—Among the novelties and improvements of surgery in the present century, few rank in magnitude and importance above those associated with the pathology and treatment of tumors of the jaws. Judging from what might be seen some thirty or forty years ago of large tumors in connection with these bones, and what was said on such subjects by earlier authors, we need not hesitate in coming to the conclusion that little was done in such cases, and that nature was permitted to take her course.

"Of all innovations the operations for removal of tumors of the jaws have created the greatest impression on my mind. There is little active excitement associated with the operation of lithotomy; and ovariectomy, although involving the life of the patient, and demanding both energy and courage on the part of the surgeon, cannot, as regards performance, be considered a high-class operation. But for the perfect removal of

* This paper is profusely illustrated, but the engravings are necessarily omitted.—Z.

these tumors, I am inclined to think that the highest requirements of operative surgery are called forth. There is such variety of manipulation, such necessity for caution, yet such boldness in action, that in my opinion neither removal of ovarian tumors, nor of the most formidable growths in the scrotum, can at all compare in scientific accuracy with those upon tumors of the jaws.

"Whatever may be thought on these matters, there can be no doubt of the value and importance of the operations; and as it has fallen to my lot to have had considerable personal experience in such cases, I feel that I can scarcely do better than devote one of these lectures to the subject.

"The anatomy and physiology of the jaw-bones, as also their pathology, from shape and function, may be considered as in many respects different from other bones of the body. The association of the teeth with them is a physiological phenomenon, and forms an element for mischief, or, to use a more appropriate term, disease, such as is absent in all other bones. Yet I am doubtful if the teeth really induce much mischief in these bones. The varied ails to which teeth are liable may, and generally do, leave the jaws unscathed; yet, when tumors are present, a question is often raised as to the injurious influence of certain teeth. The abstraction of a tooth in such a case is merely fencing with the outside of the disease. In irritation of a socket this, doubtless, may do good, although at a sacrifice which time might possibly save, but I cannot say that I have ever seen the removal of a tooth produce any substantial benefit in the cases under consideration. The tumor itself must be removed if good is to come from surgical interference. I trust that I am not less acquainted than my neighbors with common-sense surgery, but I never saw a tumor of the jaws dispelled by constitutional treatment. In doubtful cases, and where there has been much derangement of health, I have seen favorable changes, in time and through judicious management. I have even seen a case, where, to all appearance, a tumor was malignant, deep-seated, and beyond all hope of a cure, either by nature or surgical interference,—such an opinion was given by one of the best surgeons of the day, and such, I confess, was my own,—yet, in the end, it proved to be only a chronic deep-seated abscess, which burst, and got well spontaneously. Such mistakes do little credit to surgical diagnosis, and let us hope that they are of rare occurrence.

"But I wish now to refer to such cases as are beyond the power of hygiene, and where a process of removal is decided on. Caustics are of little value, ligatures out of the question; in short, whatever enthusiasts may think of their skill in treatment, constitutionally or locally, I wish to speak solely of those requiring cutting for their removal—I wish to speak of excision of portions or of the whole of the jaws.

"I have selected this theme on the present occasion, partly because it is illustrative of the progress of surgery in the present century, and partly because I imagine that my favorite conservative practice may be as usefully developed here as in any other region of the body, or in other cases of surgery.

"The first and early operations for removal of tumors in or of the jaws, initiated by Dupuytren, Gensoul, Hodgson, Wardrop, Lizars, Syme, and others, produced great sensation in the surgical world. In cleverness of conception there seems scarcely a doubt regarding them in the present day; and in vigor of execution they have not yet been surpassed. Yet,

even here, it may be doubted if perfection has been achieved; and I venture to make—indeed, I may say, reiterate—my humble contribution toward it, for most that I am now about to say has been stated over and over again in my clinical teaching.

“I have no doubt that in diseases of the jaws operations have been performed when they were not warranted; and I am equally of opinion that they have been neglected when they might have proved of the utmost value. Here, as in other departments of surgery, perfection will probably never be achieved. Mistakes and improprieties will occur even in the best regulated minds and hospitals. I make no pretensions to be above them myself; but, by way of originality, I shall plead for a share of conservatism, even here, where it has been comparatively little thought of.

“Happily, cancerous tumors of the lower jaw are somewhat rare; but cancerous ulceration, beginning in the gums, or more probably extending to them from the cheek or lips, is by no means uncommon. When the surgeon can encompass the disease in the cheek or gums with the knife, he may clip away the alveolar ridges with good prospect of a satisfactory result, provided the disease be of the kind called in modern days ‘epithelial.’ If there be no glandular affection in the neck, the operation is likely to succeed, just as with cancer of the lower lip; but where that kind of cancer has eaten away the lower lip, and laid hold extensively of the bone itself, I deem excision a misapplication of surgery. There is not the smallest chance of a permanently successful issue. I have known this done, and even a flap of skin brought from the neck to fill up the gap; but I doubt the wisdom of the proceeding.

“I look upon the lower jaw as giving the most forcible examples of the value of a doctrine which I have long advocated—albeit, contrary to the opinions of many, possibly even against the ordinary doctrines of surgery. In one of my lectures last year I referred to this. Tumors of the lower jaw are often removed by vertical section, and both ends, so to speak, of the bone are left. Every one knows how successful these operations usually are. When a section is made in the healthy part, it may truly be said that disease seldom if ever returns. Yet this feature is totally lost sight of in the bones in other parts; and so if a tibia or fibula be affected with tumor, nothing but total ablation will satisfy. Amputation in the thigh is the step. If the femur is affected, the hip-joint only will suffice for the sweep of the amputating knife; and a like pathology prevails in regard to other long bones. But in the lower jaw the surgeon will cut out an inch or two, or two-thirds, of the bone by transverse section, and the pathologist very properly, in my opinion, says not a word against the proceeding. I had great pleasure last year in referring to Mr. Syme’s views on this subject, while alluding to his novel and bold operations on the scapula and head of the humerus, which he performed with a view to preserve the greater part of the upper extremity; and my own impression is so strong in regard to this that I actually advocate horizontal sections of the lower jaw when it appears practicable. If only as much, in a state of health, can be retained as shall in some measure preserve the shape of the lower part of the face, so as to prevent the collapse which takes place when the whole mental portion is taken away, I fancy that the surgeon enacts a good example of conservatism.

“Again, in operations here, it has been much the custom to make the incisions run into the mouth, thereby involving division of the lower lip.

Now, although I do not mean to deny the occasional necessity for this extensive wound, I am strongly of opinion, from my experience, that there is no urgent necessity for division of the prolabium. The mobility of the lips is such that if the mucous membrane of the cheek, which runs to the gums, be divided, the labial orifice may be moved extensively,—so extensively that any reasonable manipulation may be effected on the jaw itself. I know that this limitation has been occasionally resorted to, but it has not been specially referred to as an advantage. I am, however, convinced of this, that even in the removal of the largest tumors there is no necessity for the extensive incision referred to. It may be asked—What does that extensiveness imply? It may be only a quarter of or half an inch! and the question is just such as I desire to answer. Besides saving the lip entire, the principal blood-vessels—the labial artery and vein—are untouched; and so there is neither trouble as regards readjustment, nor hæmorrhage, as when the lip is cut. If it be needful to cut vertically through the whole thickness of the bone, I fancy that the operation can be done by a lunated incision, just below the lower margin of the bone, with ends reaching upward, almost as readily as if the mouth were opened at the lips,—the semilunar flap being so easily turned upward, while the division of the mucous membrane will sufficiently relieve the cheek as to let saws and cutting forceps be applied to the bone. If a tumor involves much of the base, division of the facial or external maxillary artery is a necessity. It is from this vessel alone that severe hæmorrhage is to be expected, but by tying it at once, or by judicious temporary pressure, there need be no fear on this point. When a ligature is used, I strongly advise that both ends of the vessel be tied, for in one instance I had great trouble from secondary bleeding from the upper end of the vessel eight or ten days after the operation.

“But I am more anxious to refer to operations on the upper jaw than on the lower; for I fancy that I can say fully more that is original in regard to these than those on the lower. I am as strongly conservative here as in other parts of the body; and in this locality I use the term in a double sense, both because I think that parts may be retained which have generally been removed, and because I think that even the features may be more effectually preserved by certain steps than by others.

“The modern idea with regard to the removal of tumors in the upper jaw has been associated with excision of the whole of that bone; and the operations of Gensoul, Lizars, Syme, and others, who were the earliest advocates of this proceeding, seemed to imply the absolute necessity of removing the whole of it. The essence of the operation, so to call it, consisted in isolating and cutting through parts of the extreme points or circumference of the bone—even the sacrifice of the malar bone by dividing the zygoma. The round bulging part of the bone behind at the pterygo-maxillary fissure, the orbital plate, its margin or whole extent, the nasal surface, and the palatine plate, were all marked out for removal in excision of the upper jaw. Now, while not inclined to call in question the propriety of what was done and advocated by these early operators, I fancy that a better style of surgery has made such sweeping proceedings scarcely needful. It does not appear that much was done in former times for the removal of such growths. A few rare cases have been recorded on which operations were performed; but such proceedings were far between, and had no position in the roll of our operations. So, when mod-

ern surgeons began the excisions now so extensively recognized, tumors of a large size were more frequently met with than in the present time; and hence, perhaps, the necessity of reaching those outside points that I have just referred to. But in recent days the surgeon interferes at an earlier date, and before a tumor has implicated the bone extensively. It is in such instances that I believe there is room for improvement both in diagnosis and practice, and it is here that I make so bold as to propose that which I conceive to be different from ordinary accredited proceedings.

"In operations on this bone, as on the lower jaw, and as with bones in other parts of the body, I take the liberty to protest against the doctrine that the whole bone must be taken away when there is tumor present. Indeed it is largely in consequence of what I have seen in the maxillæ that I have come to the practical conclusion that total excision is not always needful in the case of tumors.

"Again I express my conviction that, in removing diseases of the upper jaw by the extensive separations referred to, the modern surgeon has been amply justified; but I feel equally confident that in many cases there is, or has been, no need for such destructive work. The malar bone, for example (separated, be it observed, by an articulation from the maxilla, and therefore not within the scope of certain so-called physiological or anatomical laws) has often been removed, although there has been no trace of disease upon it; but all for the sake of making sure of the total extirpation of the jaw-bone. Now I make bold to say that all this destructive surgery may in many instances be avoided, and that partial excision will prove, on the whole, as effective here as I am convinced it does in other parts. In certain instances the malar bone may be saved; in others the surface next the pterygo-maxillary fissure need not be interfered with; in many the floor of the orbit need not be touched, nor the nasal surface, nor the palatine plate. Much regarding these views will depend on the individual character of the disease; but of this I am convinced, that in the majority of such cases one or other of these parts may be saved. It is scarcely possible to overrate the advantage of saving one or more of them, nor do I doubt that a general feeling must be on my side in this opinion. But the question may be asked, How can such parts be saved? My answer is, to let them alone when they do not seem to be involved. But, again, it may be asked, How can you let them alone if division is to be effected at such extreme points as the zygoma, at the outer side of the orbit, the apex of the nasal process, the junction with the other maxilla in the mesial line at the alveoli below the septum, along the roof of the mouth, and also at the palatine junction with the palate bone? Hard questions seemingly! yet, in my opinion, as easily answered as anything associated with conservative surgery. Just take away that which is in disease, and leave that untouched which is in health.

"But, supposing the doctrine which I advocate admitted, how can this be done effectually? And here I come to one of the chief objects of this lecture. My view is, that instead of attacking disease of the upper jaw at its circumference, as has been the almost invariable practice since Gensoul's proposal to excise the whole bone, it is better to get into the disease as it were, and cut from the centre to the circumference, making sure that in doing so, that circumference shall be thoroughly encompassed. But where, it may be asked, are the instruments to do this? It was an old practice with the chisel and mallet, but it did not answer! These are

the instruments: small saw, bent forceps, and gouge. The saw, commonly called Hey's, these bent forceps, and the gouge are almost essential to the process I am now referring to. The saw may be dispensed with, but the forceps and gouge are well-nigh absolutely requisite. My opinion is, that in such operations, if the great mass can be removed by adequate cuttings at convenient parts, any remaining portions may be readily clipped away by such forceps as these, or scooped out with the gouge; the rule being to clip or gouge until healthy surfaces are reached; and if this cannot be done, for fear of going too deep, then the surgeon may conclude that the disease has gone further than he calculated, and that it is beyond the reach of operation. By such a course as I have now indicated, I have frequently cleared the upper jaw of its diseased deposits, and left both orbital and palatine plates entire, and, as a matter of course, the posterior surface. The nasal side of the bone I have never taken much into account in these cases, for I think it of little consequence compared with the intention and magnitude of the operation.

"Associated with these views and with the style of surgery implied, I must endeavor to impress some further points which I humbly consider almost as important as those to which I have just referred.

"There are no incisions that I know of in operative surgery—not even excepting that for ovariectomy, which in reality is a bugbear—so frightful to behold as those for removal of the upper jaw. There have been few modifications of Gensoul's and Lizar's, and that from the angle of the mouth toward the zygoma has been the favorite, when the tumor has not been very large. If it has been large, then such incisions as these have been most in esteem: that from the angle of the mouth to the zygoma, and another from the margin of the lip immediately under the ala in a direct line upward to the inner canthus, and thus a sort of triangular flap of the cheek has been raised off the tumor. I have frequently practiced all these plans, with the exception of Gensoul's, which I have always avoided in consequence of its destructive character as regards features; but for many years I have found that less extensive incisions will suffice, particularly if placed as I imagine they should be. The wound from the angle of the mouth to the zygoma is, I think, the most objectionable of all, the cicatrix being conspicuous ever after.

"After all my experience and repeated trials, I have latterly formed a strong opinion that the features of the face may be better preserved than as yet by the generality of surgeons; and my anxiety to impress these views is certainly not the least object of this lecture. First, I consider that many tumors of the upper jaw may be summarily removed without cutting the lips or cheek at all; and next, should more space be needful, it may be gained at less cost of feature than has generally been supposed. In dealing with the upper lip for removal of tumors of the upper jaw, I greatly object to any other incision than one in the mesial line, which must be run into one, or both nostrils if required. There are two advantages of great importance, in my opinion, associated with this incision. First, the wound, being made in the furrow below the columna, and exactly in the middle of the lip, is less observable than on any other part; and next, there is an inch in length gained by the natural opening of the nostril. The ala of the nose is so easily raised, and with the tip can be so easily moved according to the will and wish of the operator, and the cheek can be so readily dissected off the tumor as high as the margin of the orbit and as far out as the malar bone, that a large space for opera-

tion on the anterior surface of the maxilla is easily made. Since 1848 I have never made any other incision in the upper lip; and I have no hesitation in stating, from experience of twenty cases or more, that in a number of operations of moderate-sized tumors there is no need for more extensive incisions on the outer surface of the face. I have removed even such a large tumor as is here displayed through a single incision in the upper lip like that advocated.

"Should it so happen that, the tumors being large, more room is required, I am further led from my experience to prefer an incision alongside the nose, and a horizontal line indicated, to those of Gensoul or Lizards on the cheek. By these incisions through the lip, up the side of the nose, and along the lower eyelid, as far out as may be needful, say even to the zygoma, all the room required for the removal of a large tumor may be secured, and the most conspicuous part of the cheek may be left untouched. Another great advantage which I claim for these incisions is that the chief vessels of the surface are all divided at their narrowest points, and thus hæmorrhage is less severe than when the facial artery is divided in the middle of the cheek, as in the common incision.

"I am unable from want of time to dwell longer on this subject; but, before concluding, I must state my impression that the views regarding operations on the upper jaw, to which I have now drawn attention, and which, whether for good or for evil, I must claim as my own, cannot be carried out excepting by the use of such instruments as are here shown. The Hey's saw and the gouge were familiar to surgeons before my time. The straight cutting forceps, depicted by Scultetus in former years, and brought into fashion in modern surgery by Liston, are of limited use in such instances; and where prejudice or ignorance does not prevail, they may be said to be entirely set aside by these angular ones, which effect all, and even more than the straight ones. But in particular these semicircular clippers will be invaluable; and, with curves of different circles, the largest tumors may be circumscribed by them. If even some of the tumor should not come away with the mass, the blades will enable the surgeon to remove the whole, and clip upon the healthy surface.

"While recommending these angular and semicircular forceps, which I claim to have originated for surgical purposes, I cannot omit referring to these additional blades as being of the greatest imaginable value in the removal of some tumors in the upper jaw. A quarter of a century ago, in imitation of an older custom, small hook-beaked blades were used for seizing arteries, on stumps and other open surfaces, when ligatures were required. They were likewise of use in seizing and holding small tumors during removal. It was Mr. Liston who, I believe, gave them the name of the bulldog forceps. In my early experience in operations on tumors of the upper jaw, I had observed the difficulty of separating them, even after a free use of saw and forceps; and this instrument was a device of my own to facilitate that step. The commanding size and strength of these blades give facilities for wrenching out a tumor of the upper maxilla previously unknown. Their grasp is such that, in comparison with the others, I called them the lion forceps; and they are now well known under that name, although not so well by my own, for it is not long ago that a London hospital surgeon, who, being provided with one of them for an operation he was about to perform, asked me if I had ever seen the instrument, and kindly directed my attention to it as one of peculiar merit! In operations on the lower jaw it will be found of wonderful service in

keeping all steady during the application of the saw or in disarticulating; and in various operations elsewhere, when a stronger catch than the fingers can give is required, their use in my hands has added largely to the value of my digital resources.

"In the preparation of this lecture I had sketched the chief features of diseases associated with the jaws, and particularly those associated with the antrum; but I found it impossible to keep all within the appropriate limits, and, being anxious during such an opportunity as this to state my views and practice when operations are required in such cases, I have thought it best to omit that which in my estimation had less of the aspect of novelty than the portion which I have now submitted to your notice. You may have observed that here, as in certain other departments of pathology and operative surgery, my mind takes a strong local bias, and I advocate what some may think or call restricted measures, in preference to those of a more sweeping kind which involve the destruction and loss of a considerable amount of sound substance around. I trust that I shall not be misunderstood here. I advocate the removal of all disease when an operation is really undertaken for tumors. If there is no malignancy, there is, according to rule, no need for taking away more than the disease. If a sound surface is left, that is all that the surgeon need care about. If the disease be malignant, I have great doubt if cutting widely beyond it makes much, if any, difference as to its return; and this pathology I apply particularly to malignant tumors in bone, for very generally when there is a return, it shows in the soft parts more than in bone. Of course I willingly admit that every now and then the renewed mischief really does come in the bone; but that feature should, in my opinion, contribute to form the exception rather than the rule for such operations as we have had under consideration to-day. In addition, and in some degree to give reasons why I advocate conservatism in their performance, I may state that I entertain views as to the original and early seat of many of these tumors about the antrum which are in some respects peculiar. Most surgeons, I believe, have an impression that when a person is said to have a tumor in the upper jaw, or, to be even more precise, in the antrum, the whole of this cavity, with its walls, is so involved that in any operation for removal there is an absolute necessity that this circumference—the walls of that cavity—must be taken away. Now it is my opinion that disease in the antrum, beginning in the cavity as it were, is much more rare than most people think. My impression is, that in many, if not most instances the wall of the antrum is the part first affected, and that its cavity is gradually filled by the growth, and then perhaps expanded. Actually, in some instances, so strictly local is the disease that the antrum may be in a manner displaced and compressed, while its mucous lining remains without indication of disease. This I have particularly noticed in tumors which have had their origin in the alveoli; and I have seen frequently growths of considerable size here which have projected forward, downward into the mouth, and even upward, and yet have left the antrum scarcely if at all involved. Any part of the circumference of the antrum may be the original seat of a tumor, and if such tumor be attacked by an operation at an early date, I maintain that it may be removed, and the rest of the antrum or jaw be left. If it so happens that the tumor is chiefly associated with the posterior wall or part of the antrum, the diagnosis will be more difficult, and if an operation is performed the destruction of comparatively sound parts in front must be extensive in propor-

tion; but if the tumor happens to be at any other surface, it is in my opinion of great importance to reserve as much as possible by removing only the offending part. It is unfortunately too often needful, owing to the extensive development of the disease, to remove all between the tongue and the eyeball; but cases are frequently met with of a more limited extent, and if the surgeon follows the practice which I have ventured to characterize as a modern improvement, viz., to interfere at a reasonably early time, so as to arrest the tumor in its onward progress, he may remove the disease, and yet save the greater part of the upper maxilla. In one case the sacrifice of only the inner or nasal wall of the antrum will suffice; in another the front may alone require removal; again, probably the floor of the orbit or roof of the antrum may be involved, or possibly only the lower part of the antrum—that is, the roof of the mouth, with, perhaps, the alveoli. To save the floor of the orbit, as happily may often be done, is in my opinion of great importance; but of all these local operations that I am now advocating, that of removing disease, and at the same time preserving the roof of the mouth, is the one of most importance in my estimation, and, where the extent of disease will permit, the surgeon should make every effort to do so. I have known a sound alveolar ridge, a perfect set of teeth, and one side of the roof of the mouth all sacrificed to get at a comparatively small tumor in the antrum, which could readily have been removed with the sacrifice of only the front wall of the cavity.

“But time tells that I must cease, and I shall do so after a few words more.

“The dread of hæmorrhage was great in the early days of these operations, particularly when the upper jaw was affected, and it was the custom for a time to begin by tying the common carotid, but that practice was soon given up. Vigor and rapidity of action are the best safeguards against this danger.

“Every now and then one hears objections to chloroform in such operations. For my part I have none. I have used it invariably since the introduction of anæsthesia, and I have never had reason to trace evil to it. It has seemed to me a greater boon to a patient in such an operation than in almost any other, for there are few more severe or frightful in the whole range of surgery.

“In offering these observations, I speak from a personal experience of between thirty and forty cases. Twenty of them have been performed in King's College Hospital. I did not scruple in my lecture on Lithotomy to tell the fatality of that proceeding in my own hands; nor need I hesitate here to remark upon the seeming comparative immunity to life of operations on the jaws. There have been returns of disease and ultimate deaths, as with cancers and fibro-recurrent tumors elsewhere, but of the whole list of my cases I have lost only five—a success which, as compared with lithotomy, seems remarkable, particularly when we take into consideration the huge wound in the face as contrasted with the limited incisions in the pelvis.

“At one time, before the cares of life were deeply felt, I occasionally said that my thoughts, during waking hours, were never five minutes consecutively off my profession. With an indifferent memory for many things, I fancy, if I can judge myself aright, that I have a tenacious one in surgery. It is well-nigh forty years since I, as a lad, first witnessed one of these operations on the upper jaw performed in the Royal Infir-

mary of Edinburgh by my late esteemed friend, Sir George Ballingall,* yet my recollection of the scene is as vivid as if it had been yesterday; and I have an equally lively recollection of the exciting descriptions of certain operations on the lower jaw, published by Mr. Cusack, of Dublin, about the same date.

"I end this lecture as I began it, by stating that I know of no operations so exciting and so likely to rivet attention as those which we have just had under consideration."—(*Lancet*.)

"Odontological Society.—The ordinary monthly meeting was held on Monday, the 5th inst., at the hospital, Soho-square, the President, Thomas Rogers, Esq., in the chair. Mr. Coleman called the attention of the Society to a case in which torsion had been unsuccessful, owing to the spiral shape of the fang, causing the tooth when turned, to come out of the socket. Mr. Woodhouse said his plan had been never to attempt torsion after the tooth had been through more than a year. Dr. L. Levison read a paper entitled 'Some remarks on a few human skulls, as furnishing data in proof of the brain being under similar laws (organic) as induce the development or wasting of the muscular system; and that as most of these skulls are abnormal specimens, they furnish some suggestive explanations of certain forms of disease in the dental organs.' Mr. Woodhouse read a paper 'On the Use of Carbolic Acid in Dentistry.' He said that carbolic acid in the operation of excavating a tooth for stopping, from its cauterizing property, was exceedingly useful in rendering a fresh prepared surface of the cavity less sensitive before filling it. The acid was most useful in cases where the pulp was exposed, and where, without its aid, the general practice would be to destroy it. After describing the mode of treatment, Mr. Woodhouse read notes of cases prepared by Mr. Gibbons, in which the acid had been successfully applied to the treatment of sensitive dentine, exposed pulp, and alveolar abscess. A long and animated discussion followed, various members of the Society narrating cases where the application of carbolic acid had been most successful."—(*Medical Times and Gazette*.)

Calculus removed from Submaxillary Gland.—The Liverpool correspondent of the *Medical Times and Gazette* states "a few days ago I saw Mr. Bickersteth remove a very large calculus from the submaxillary gland. The patient, a medical man, noticed twelve months ago an induration, which gradually increased without involving any of the surrounding structures. When Mr. Bickersteth first saw him the right gland was almost the size of a hen's egg, and as hard as scirrhus, a circumstance that very naturally created apprehension in the mind of the patient as to the nature of his complaint. A small probe was introduced through the duct, and a grittiness at once suggested the presence of a calculus. In every other respect the patient enjoyed good health. Mr. Bickersteth determined to remove the calculus by the mouth, so as to avoid that risk of leaving a salivary fistula which would have been incurred by adopting the simpler method of extraction by external incision. The operation consisted in slitting up the duct on a small director until the calculus was reached; the opening was then enlarged, partly by dilatation with the finger and the cautious use of the knife, until there was sufficient room to allow of the introduction of an ordinary pair of lithotomy forceps. The calculus

was then seized, but being rather soft had to be removed piece by piece. I should say that it was about the size of an ordinary walnut. Dr. Edwards finds that it consists of pure tribasic phosphate of lime, appearing under the microscope to be aggregated in very thin layers. Since the operation the patient has done exceedingly well; some slight induration, the result of inflammatory action, still remains. It is exceedingly rare to find salivary calculi of so large a size; usually we find them small, blocking up the duct and impeding the flow of saliva into the mouth."

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"Laryngoscopy. By HORACE SWETE.—I have recently been reading, with much pleasure, Dr. M'Kenzie's interesting treatise on laryngoscopy. I feel some hesitation in adding anything my small experience of laryngoscopy may suggest to that of so close an observer as Dr. M'Kenzie, but neither he, nor any other writer I have seen on the subject, seems to have used glycerine on the mirror to prevent the condensation of the breath. I have for some years made use of it on the mirror for examining decayed teeth, and since I have used the laryngoscope have found it of great use. The mirror keeps perfectly bright; and if a small film of glycerine is applied to it, waiting till all bubbles and streaks have disappeared, it does not seem to diminish the reflection of the parts of the larynx. I would also suggest that the little tubes now seen in every druggist's window for blowing out a fine cloud of scent, etc., might be utilized for the application of solutions, astringents, etc., to the larynx, or, indeed, the eye. The particles of fluid are very small, and this simple instrument seems to me quite as effectual as the elaborate and costly one figured in Dr. M'Kenzie's book as 'Lewin's Pulverisateur.' The doctor's light-concentrator seems invaluable, and will be of great service to country practitioners in microscope work where it is impossible to procure gaslight. As a practical hint for this or any other operation at night, the country doctor who 'does his work on wheels,' has always a good light at his command in a couple of spare lamp lights in his driving-box; these give a light almost equal to gas, and far superior to the half-dozen tallow dips offered in the cottages of the poor."—(*Lancet*.) —

• *"New Adhesive Tissue.*—M. FORT, of Paris, proposes the following compound in lieu of the ordinary court plaster. Unlike the latter, it is flexible, not subject to cracks, and extremely cheap. Picked gum arabic, 75 grains; distilled water, 120 grains; glycerine in sufficient quantity. The gum is dissolved in the water, and to this solution a proportion of glycerine is added, enough to give the mixture the consistence of syrup. The solution is then spread with a camel's-hair brush on very smooth linen, which latter should be first gummed, to prevent the solution from running through the meshes. The operation should be done rapidly, and the number of layers regulated according to the thickness required. It should be cut into strips, and slightly wetted with water before it is used." —(*Ibid*.) —

"Natural Selection.—MR. WALLACE, the English naturalist, in a paper recently read before the Anthropological Society, arrives at the following conclusions, which help to account for the variation and transmutation of species: (1.) Peculiarities of every kind are more or less hereditary. (2.) The offspring of every animal vary more or less in all parts of their organization. (3.) The universe in which these animals live is not absolutely invariable. (4.) The animals in any country (those at least which

are not dying out) must at each successive period be brought into harmony with the surrounding conditions. These are all the elements required for change of form and structure in animals, keeping exact pace with changes of whatever nature in the surrounding universe. Such changes must be slow, for the changes in the universe must be very slow; but just as these slow changes become important, when we look at results after long periods of action, as we do when we perceive the alterations of the earth's surface during geological epochs: so the parallel changes in animal form become more and more striking, according as the time they have been going on is great, as we see when we compare our living animals with those which we disentomb from each successively older geological formation."—(*Annual of Sci. Discovery.*)

"*Alloys.*—Every thoughtful metal worker, who has his hands too full of his daily employment to spend much time in experimenting on the properties of the metals he uses, must have often wondered how it has come to pass that, with all our boasted knowledge of chemical and metallurgical subjects, we have as yet only succeeded in inventing some half-dozen useful alloys. Brass, pewter, gun-metal, German silver, and type metal are really all the alloys that we can name as entering into the manufacture of the more common articles of trade in this country. The causes of this apathy in experimenting on the properties of mixed metals are manifold. The practical metal worker of the present day is generally ignorant of the chemistry of the metals he uses; and even if he were well informed, he would be too busy fighting the great battle of competition to set himself the extra task of experimenting upon alloys. But metal workers will turn round very naturally and ask how it is that practical chemists, whose business is to make experiments, do not investigate the capabilities of metallic mixtures more frequently than is at present the case. We fear very much that the only answer to be given to this is that scientific chemists of all countries have, almost without exception, been bitten with a mania for nearly exclusively pursuing their researches and expending their talents upon organic compounds. This department of scientific chemistry is so vast and so fruitful in results that it is quite a rarity to see an article in a scientific journal upon a metal or metallic compounds. Even those chemists who have not wholly given up the study of inorganic compounds seem to apply themselves to analytical observations or to the investigation of the rarer metals. As an example of the want of knowledge of the capabilities of alloys, we may instance the discovery lately made by M. Pelouze, of the French mint, that the best metal with which to alloy silver is zinc, and not copper, as we have always believed. Now, considering that silver has been known from the remotest ages, and zinc, at any rate, since the birth of modern chemistry, it seems singularly strange that no one ever thought of trying the effects of these two metals on one another until now. To take the case of iron, a merely cursory examination of the second volume of Percy's '*Metallurgy*' will show that some of the very simplest questions relating to this most common and important metal remain as yet unanswered. Such an apparently vital matter as the formation of steel is a bone of contention at nearly every meeting of the French Academy of Sciences, one party persisting in declaring that no steel can be made without the intervention of both nitrogen and carbon, while the other side as manfully contend that nitrogen has nothing to do with cementation, carbon being the only element concerned in the process. This example shows that not only does the action of one metal

upon another in a state of combination require patient study, but also the effect of the addition of varying proportions of the metalloids, such as carbon, phosphorus, silicon, sulphur, etc., to different metals, remains still to be discovered."—(*Ironmonger and Chemist and Druggist.*)

"Action of Fluxes."—A flux is a substance which will dissolve a metallic oxide, and will not dissolve the simple metal. Fluxes are employed in two operations.

"If a quantity of shot and salt be mixed together in a bowl, the shot will remain scattered through the mixture separate from each other, but if the salt is dissolved by the addition of a sufficient quantity of water, the shot will all collect together at the bottom of the bowl. In the same way, when iron is reduced from the ore in a smelting furnace, it is in small globules or masses, that are held separate from each other and supported by a mass of silica and other infusible substances, which were mingled with the ore. If we bring lime in contact with the silica, the two combine together and become glass, which is melted by the heat of the furnace, and thus allows the small masses of molten iron to sink down through it to the bottom of the furnace. This is the use of a flux in reducing metals.

"The other operation in which fluxes are employed, is the welding or joining of two metals, or two pieces of metal, together. In this case the flux is employed to dissolve the thin coating of oxide from the surface of one or both metals, in order that they may come into actual contact. Iron has a very strong affinity for oxygen, especially at high temperatures. If two pieces of iron are heated for welding, as they are taken from the fire into the atmosphere, they immediately become coated with a thin film of oxide of iron, which prevents them from welding together; but if a little borax is sprinkled over the ends to be joined, it dissolves this film of oxide, which, in the liquid state, is squeezed out under the action of the hammer, and the surfaces of pure metal are brought in contact.

"This article was suggested by the process of tinning copper sheets, which was witnessed at John Trageser's Steam Copper Works, at No. 60 Greene Street, in this city. A sheet of copper was first pickled for about two hours in a bath of dilute sulphuric acid, and was then placed on the level surface of a mass of brickwork, in the middle of which was a neat little charcoal fire. The workman pushed the sheet over the fire, and then placed upon its upper surface a small plate of block tin, which was soon melted. As the tin was about to melt, the workman dusted the surface of the copper with salammuniac, to remove any film of oxide of copper either remaining from the action of the pickle, or which might have formed after the sheet was taken from the bath.

"In none of the cases does the flux act to melt the metal at any lower temperature, or to render it more fluid, but it permits the metal to flow more freely by removing obstructions from its path."—(*Sci. Amer.*)

New Combustible.—"I see the mention of a new combustible, invented by a gentleman who very appropriately bears the name of Stoker. It appears to be very pure charcoal, finely ground and made into a paste with starch. The paste is moulded into cakes or balls of different sizes, and then dried. When perfectly dry these may be lighted with a lucifer match, and will continue to burn steadily, like German tinder, without giving flame or smoke. The combustible is intended for heating urns, chafferettes, etc."—(*Paris Correspondent of Chemical News.*)

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, SEPTEMBER, 1865.

No. 2.

ORIGINAL COMMUNICATIONS.

THE AIMS AND DUTIES OF THE DENTAL PROFESSION.

BY N. C. KEEP, M.D.

Address before the Massachusetts Dental Society at its first annual meeting, May
18th, 1865.

WITH gratitude to Almighty God, that peace has dawned upon our nation, we meet to-day to celebrate this, our first anniversary.

The first thoughts which arise, regard the formation of our little band, the mutual acquaintances which we have made, and the pleasure and profit which we have derived from the interchange of ideas.

We feel that we are the better prepared to discharge our duties to our patients. We find confidence and friendship taking the place of that distrust and alienation which might have existed, and which would have prevented the highest usefulness of our profession.

Our first obligation as dentists is to our patients; we are in honor bound to seek their interests before our own. The customs of trade may have sanctioned sale and purchase where only one party could be benefited, but no one regards it honorable in a dentist to extract a tooth without first assuring himself that the comfort and welfare of the patient require its removal. If he persuades patients to have good and useful teeth extracted to make way for artificial ones, or, if he allows a patient to persuade him to remove living and useful teeth that more comely ones may be introduced, he dishonors his calling, and deserves the indignant reprobation of both the profession and the public.

The liberal charter which has been granted us by the Commonwealth, and which we have this day accepted, gives us a legal existence as an institution for raising the standard of professional education, and enables us to cultivate harmony and good fellowship among ourselves; and, if we are faithful to our trust, will secure to us a position among the educational and beneficent institutions of America.

We, therefore, invite those of our brethren who have enjoyed the confidence of the community; who have shared both the exhausting labors of a most wearying profession, and the honors and emoluments which crown success, to lend their aid in the present undertaking

It is our purpose to establish a museum. In this, rare and curious specimens are to be collected, and can be preserved far better than in private cabinets; and the museum will be accessible to all who wish to study its contents. It would be, indeed, laudable in those who possess cabinets crowded with preparations, casts, models, records of cases, and other material, to make this Society the depository of their treasures. Otherwise these are liable in a few years to be scattered and lost, when their present owners may no longer have control over them. If this suggestion should be adopted by the owners, they would make a substantial contribution to public science, save their valuable specimens, and lend material aid to the advancement of dentistry.

We are, moreover, to have a library; and we hope to receive sufficient donations to make this also a useful department.

We owe it to ourselves to make ours a liberal profession. Without enumerating all that a liberal profession comprises, we may safely say that it requires those of its members who have, through their own efforts or the teachings of those who have preceded them, made improvements in dental science, to perpetuate those improvements for the benefit of succeeding generations; and under no circumstances whatever, to desire or even to consent that those improvements should *live* and *die* with themselves alone.

In what way those improvements shall be communicated, is, no doubt, an important and difficult point to be decided. It is, perhaps, equally difficult to decide what shall be the compensation for valuable contributions to knowledge. In my opinion, the very best mode of communication is by *personal* instruction. Let those who would be taught form classes, and engage gentlemen of the highest talent and acquirements to communicate to them, for a liberal compensation, by lectures, and demonstration in the laboratory, and by the chair, their discoveries and improvements.

This mode of instruction has its limits. It cannot be a complete substitute for a college for training dentists, of which I propose to speak presently. But it has the advantage that it recognizes the right of property acquired by one's own research. It is an honorable way in which such knowledge may be imparted and received without the intervention of patents, so universally disliked by the profession. A limited course of clinical lectures, as above alluded to, would be of great advantage to the younger practitioners who may have already been instructed in the theory of the dental art. But we need more than mere lectures; we need facilities for acquiring a thorough professional education. I am

most happy to say that much that is required for elementary and adjunctive education is already within our reach. I refer to the advantages offered by the Institute of Technology, recently established in this city by the munificence of large-hearted and public-spirited members of our community. This Institute has already become the rallying point for those who would learn the laws which govern matter.

My own predilections would favor a thorough and united dental and medical education. I should hope, in such a case, that the degree of M.D. would be the lawful and merited appendage to the names of those young men who enter our specialty. If this, however, is not yet attainable, it may not be out of place to inquire whether Harvard University might not appoint professors of dentistry, and confer upon proper candidates the degree of "Doctor of Dental Surgery?" We are admonished, also, by the accidents to the teeth and jaws which have become so frequent since the establishment of railroads and during the progress of the rebellion, now so happily closed, that the time has come for a Chair of Dentistry in our Hospitals.

Our Society should recognize the mutual obligations of the members of the profession. All must admit that a profession as a whole should be supported, or it cannot be respected. It would not be right for a dentist who is rich to give his services gratuitously to all who might call upon him. It would be far better that he should charge fair compensation, and present the amount to some charitable object. No member of the profession ought to feel himself injured, if some one who has obtained the confidence of the community by years of toil, which may have well-nigh destroyed his health, can, and does, command large fees, which are beyond his own reach.

Let it be remembered that the number of those who can give large fees is relatively small, even in cities, and that their confidence has not been secured without heavy cost.

The habit which has existed in some places, of enticing a brother dentist's patients away, under the pretense that they can be served for less money, is very pernicious to the profession and to the community.

Does not every dentist feel that he has a property in the good-will of the patients whom he has watched over for years? Does not every *young* man hope to see the day when his labor shall also be rewarded by such patients? And is he willing to sanction a course which must, at no distant day, militate directly against himself?

The man who sends a patient away with an imperfect treatment, because he is not fully conversant with the best methods, ought to pause and qualify himself, or retire from the profession. The man who values his services at a low rate, because he himself is a learner, inflicts a heavy tax on his patients. The man who contents himself with inferior operations, because he can only command small pay, will probably find that his pa-

tients will come to the conclusion that they have paid for more than they have received.

No man ought to complain or be dissatisfied that confidence commands a high price. Financial men and capitalists understand this. Undoubted securities always command much higher prices than the uncertain, though the latter may have intrinsic value.

How shall this confidence be secured by the young practitioner? It is only necessary for him to be diligent and faithful in his calling, correct in his department, and honorable in his transactions, and time will do the rest.

I feel, also, that our Society is called upon to make known in all legitimate modes the abuses which exist among us, and are apparently on the increase, through the malpractice and deception of persons falsely claiming, and even advertising themselves, to be dentists. We may do much to enlighten the public. Physicians and those who have the welfare of all at heart, will do well to warn the community against the evils which are so ripe at this time, and which have become a fashion, and even a mania.

To some young men, no doubt, the kindest and best suggestion would be, that they reconsider their action in choosing dentistry as their vocation. Probably they have already serious suspicions that they have mistaken their calling. But to those who have mental, moral, physical, and educational requisites, every encouragement should be offered by the older members.

The use of anæsthetics has introduced a new era in surgery; and, as is well known, ether was first employed in Boston for preventing pain in the extraction of teeth.

It fell to my lot to have much to do with its introduction and early use. I soon observed that the freedom from pain was not secured, at least in many cases, without counterbalancing inconveniences and undesirable results, when only a *single* tooth was to be extracted. But the great evil which has grown up through the use of anæsthetics is this: that ignorant patients, believing that artificial teeth would be better than their natural ones, have been persuaded in some cases to have them extracted, with the assurance that, by the use of ether or nitrous oxide, they will not suffer pain in the operation. Such are thereby maimed and suffer irreparable loss, when had the natural safeguard of the fear of pain remained, common sense would have triumphed, and the natural teeth would have been preserved.

Each one of us has listened to expressions of gratitude from persons of every class in society, assuring us that our services are appreciated equally with those of the other professions.

We certainly possess the general confidence of the community. We likewise are aware of a deep personal interest entertained for the educated dentist. We may expect that those who hold us in grateful remem-

brance, will be prompt to assist by their approval, and, what is more substantial, with their purse, the educational project which we now hold in view.

Persons who have suffered themselves, or who have witnessed in their near friends, the excruciating agony of toothache, are sure to remember the timely and kindly relief, and hold in grateful recollection the one who administered it.

Then we have the hundreds and thousands whose teeth are monuments of the sanitary care of dental surgery. We can hardly say too much in favor of preserving the natural teeth. If all who assume to be dentists were skillful and conscientious, and all patients had a clear idea of their own interest, we should rarely see a set of artificial teeth needed under the age of thirty-five. We have also the honored men and women who, having combated disease and accident, have gone through the steps of having one tooth, and in process of time another substituted for the pearls which nature gave them, until at fifty, sixty, or seventy years of age they have really experienced a new dentition.

To many of this class the possession of new teeth is equivalent to a new lease of life, and constitutes a strong bond of friendship between them and our profession. Unfortunately, all those who are in want of new teeth, have not their wants so well supplied as they were led to expect. If the dentist is not an artist he will fail to preserve the facial expression. If he does not comprehend the philosophy of his art, the teeth which he makes are too apt to fail as masticators, and hence become nearly useless to patients. We need the knowledge of every science and of every art. How often have we been obliged to extemporize an invention, when an instrument was wanted which could not be purchased! The early education of the hand to execute that which the mind has conceived, has prepared the way for the eminent usefulness and honorable position of many, very many members of the profession. With increased facilities for education, how bright a future would open before the thoroughly capable dentist! But he must be a true man; he must possess more knowledge than he expects to use in the discharge of his immediate duties; he should have a cultivated and logical mind, both for his own satisfaction and that he may safely advise and counsel those who require assistance. The public does not sufficiently consider that advice is often of more value than an actual operation. It is quite time for patients and practitioners to feel that when advice is necessary, the best advice is the safest, and that it is more to be valued when adequately paid for.

As individuals, it is incumbent on us to provide for the maintenance and education of our families. It is for us, as good citizens, to bear our share in the support of the Government; to be ready at the call of want and misfortune; to lend a ready and liberal hand in aid of each department of human progress. We are to remember that there will be desti-

tute families of our own members, who will need our friendly aid in their necessity. We are to remember that our active professional life is brief. The preparation for usefulness, and the securing of public confidence, is a long and arduous task. When those obstacles have been at last overcome, what do we find our position to be? We will assume that the ambition for a full list of patients, and for occupation for every working hour has been realized; the acme of success is then attained, and more patients only hinder and retard dispatch.

The services sought are, to a great extent, personal. The patient wants the experience and judgment of the head of the establishment. After the peculiarities of the case have been carefully examined, weighed, and a decision reached, we may be greatly aided by skillful assistants. Especially are such available as executives in the laboratory. With pleasure we call to mind those who have had honorable employment for themselves, and under our guidance have enabled us to attend to more patients and produce more elaborate results than we otherwise could have done. But that our personal attention cannot be dispensed with, seems to me a fixed fact. In extending our business we soon reach the limit, beyond which success cannot reasonably be anticipated. The effect of a lame hand, or of an overtaxed nervous system, or of eyes highly strained—contingencies which happen more frequently in our profession than in most others—will sooner or later admonish us that our professional days are rapidly passing away. These considerations, furthermore, teach us that we should make systematic preparation for the support of our families, for carrying forward the benevolent objects of the day, and for the expansion of our own minds and hearts—that, in brief, we should seek to make ours a truly liberal profession.

THE AMALGAM QUESTION.

BY A. LAWRENCE, M.D.

It is neither necessary or convenient to consult the historic page to ascertain when, by whom, or by what inspiration, metallic compounds, of which mercury formed a part, were first used as a filling for decayed teeth. That it mounts to a very high antiquity, as the French say, is undoubted, as is also the fact that about 1835 the Crawcours, by the too liberal use of a basely made amalgam, under the imposing title of "Royal Mineral Succedaneum," stirred up the first commotion on the subject in the City of New York, and finally returning to the protecting care of the Lion and the Unicorn with pockets made plethoric by the dupes of their brazen charlatanism.

The flourish and success of the men referred to brought out a host of competitors for notoriety and profit, who advertised substantially the

same thing under various names, much to the mortification of the more learned and conscientious of the profession, who, although they might think it best in certain cases to use such material, were not desirous of giving undue prominence to a practice liable to much abuse. Nevertheless, gain for the time held honesty in her sordid grasp, and dentistry came near ranking below the most contemptible trades. Flattery and falsehood lent their potent aid in presenting the plausible theory that such fillings would not fail, as was, and is even now, too much the case with other fillings; and as the promise of immunity from pain gave peculiar sensations of pleasure to the auditory nerve, the patient was charmed and spell-bound until relieved by a row of black and grim-visaged dental monsters.

The American Society of Dental Surgeons, with much zeal but less discretion, took the matter up about 1844, and the year following issued its mandate, in the form of several resolutions, to all the members thereof, for the purpose of ascertaining who were Catholic and who heretic upon this now important question. Accompanying the mandate was the apostolic declaration that "any amalgam whatever * * * is not only unfit but dangerous when used for plugging teeth or their fangs," with a pledge, "never, under any circumstances, to make use of it in practice;" which pledge the faithful were expected to sign and return to the Vatican.

Upon counting noses at the next meeting, it appeared that only a few over one-half were found with beards of just the right cut,* whereupon order was taken to let the bull loose once more. * * *

Submission and contempt, each claimed the spoils from this bovine raid; the first class tremblingly gave in their adherence when summoned before the Sanhedrim, a few only, thinking discretion the better part of valor, severed their membership.

Of the contumacious, a few were summarily dealt with, and the guillotine was made the reformer where less keen intellects failed to engender the requisite conviction; but the majority, incensed at this attempt to hold the conscience captive, pelted the bull so unmercifully that he returned whence he came, and eventually the American Society of Dental Surgeons passed to where

"The wicked cease from troubling
And the weary are at rest."

Amalgam survived the onslaught, and finally received the fostering care and friendship of many of those who had so recently waged a war of extermination.

Progress ought to mark the path where science sheds her rays, and he

* It is reported that Judge Jeffries, taking a dislike to a witness who had a long beard, told him, "if his conscience was as long as his beard, he had a swinging one," to which witness replied, "My Lord, if you measure consciences by beards, you yourself have none at all."

who fails to contribute his aid in making the way more clear of obstructions is an enemy to his race, for he has received benefits from the community and made no adequate return.

Had the American Society of Dental Surgeons made some effort to improve the amalgam in use at the time in question, instead of persecuting it into general use, much more good would have been the result, but the ground taken was that such material was not susceptible of improvement. Whether this view is tenable is easily determined by the intelligence of every dentist in the country, each for himself. I vote in the negative, and hold that during the past twenty or thirty years amalgams have been as much improved in quality as have gold foils; further, that an improved practice upon more enlightened theories has demonstrated that amalgam for filling teeth is not only less objectionable than was formerly supposed, but in many cases the very best material that can be employed. On this point association has rendered us tolerant, and we have learned that every man is the proper custodian of his own conscience, whether he uses nothing but gold, except "on the sly," or nothing but amalgam with like exceptions.

I beg not to be understood as advocating the *wholesale use*, or *abuse*, of amalgam for filling teeth, for nothing could be further from my intention, but I do claim that if a dentist saves a tooth *even with amalgam*, he commits a less evil than he would in spoiling it with a poor apology for a gold filling. Why a tooth properly excavated, dried, and kept so while a properly prepared amalgam is properly inserted, and which has lasted, as I have seen many, twenty or more years, and still in good condition, may not be regarded tolerably secure, is difficult to determine. I shall not attempt to notice all the objections hitherto urged against amalgams, as many of them are too unscientific to merit it; besides, in some particulars the same faults might be urged against gold. The fact is, that in regard to all the materials used for filling teeth, the manner of using has much to do with success. Man makes the material, but the material does not make the man. I dictate to no man the tenor of his practice, nor do I intend to hold myself accountable to every flippant tyro as to the precise treatment of every tooth under my care, though they declaim without ceasing.

ORTHODONTIA.

BY J. FOSTER FLAGG, D.D.S.,

Professor of Institutes of Dentistry in the Philadelphia Dental College.

(Continued from p. 14.)

THE second cause of dental irregularity is one which though apparently simple, from the *familiarity* of the term, is wonderfully abstruse, and calls from the thinking mind efforts for its appreciation which have, in

turn, evoked that research which has eventuated in so much knowledge as we possess in the direction of general physiology—I allude to “*hereditary*” cases. When a child is presented with some deforming peculiarity which we have perhaps observed in the denture of its father, it is with an *air* of perfect understanding that we pronounce it a case of “hereditary irregularity;” but who can reflect, without utter amazement, upon germs so infinitely *more* than microscopically analogous that, as the result of years of developing aggregation, we find so small a component as a single tooth placed *relatively* to other teeth, abnormally, *as was the parent tooth, it might be fifty years before?* The serious contemplation of such workings is as much calculated to inspire feelings of high reverence for Omnipotence as is the more tangible (so called) or most fearful displays of supreme control. It is in this light that we should regard such cases; it is by such reflection that we should train the mind for easier investigation, that thus reaching out for the ungraspable we may perchance find within our circling much that will prove of value.

It may seem that my first two causes would both properly be classified as “hereditary,” and this to a certain extent is true, but I have thought that it made matters clearer by adopting a division which should, *first*, take cognizance of irregularities which had *no antecedents*, and which were only derivable by a *combination* of cell action resulting from a conversion of force emanating from both parents; and *secondly*, embracing all such as clearly possessed antecedents, it might be in one or another preceding generation. I would give as the *third* cause, habits. The first two causes, it will be perceived, are precursors of events which are entirely without the control of the patient, although they are frequently so amenable to dental treatment as to be completely prevented, even so far as not to be permitted. (I will give illustrations of this when we arrive at considerations pertaining to “treatment.”) “Habits,” on the contrary, are to a very great extent under controlling influence, either at the hands of the patient, the parents, or the dentist. Of course it would be impossible to enumerate, much less systematize, all the various “habits” which result in dental and indeed maxillary irregularity, but it is important that I should call attention at this time to such habits as sucking the fingers or thumbs, which are liable to produce one-sided development of the jaws, marked protrusion or intrusion of the teeth, and even great want of occlusion, so much oftentimes as to admit of the insertion of a thumb between the upper and lower incisors when the molars are in absolute contact! The habit of catching one-half of the lower lip between the teeth is not infrequent, and is almost always provocative of a deforming amount of irregularity, sometimes separating a large space between the lateral and cuspid, and sometimes so turning the lateral as to cause one-quarter torsion, thus presenting the mesial face of the tooth where the labial should have been. The habit of drawing the entire breadth of

the lower lip under the upper teeth is the cause of their spreading apart and protrusion to a degree which is sometimes beyond the hope of correction, and which can only be remedied by extraction of the protruding teeth. That protruding teeth can be drawn back by simple apparatus which does not require five minutes for its construction, nor more than ten minutes for its adaptation, I have repeatedly demonstrated, but it must be remembered that teeth once or twice moved are rendered thereby more movable, and thus it is that a few short months will suffice for things to be as they were before correction was undertaken unless the teeth are wired in position. I propose referring to this in future communications. The habit of protruding the tongue, which is sometimes indulged in by children during study hours, *particularly while engaged in writing*, has resulted, in several cases which have come under my notice, in irregularity and separation of the *lower* teeth, which it was impossible to *maintain* corrected until the habit was discovered and apparatus constructed for its prevention.

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

FEELING that it was desirable for the interests of the profession of Illinois to organize a State Society, about fifty dentists assembled in Chicago on the 24th of July, 1865, at eight p.m., and adopted a constitution, which was signed by thirty-eight of those present.

The following members were elected officers for the ensuing year:—

President.—Dr. A. C. Van Sant, Princeton.

Vice-President.—E. Honsinger, Chicago.

Secretary.—Edgar Park, Chicago.

Treasurer.—S. Babcock, Springfield.

Librarian.—J. A. Truesdell, Elgin.

Executive Committee.—Drs. C. B. Rising, Rockford; G. T. Smith, Princeton; L. P. Haskell, M. S. Dean, and J. C. Fuller, of Chicago.

On the following morning the Society met; eleven additional members were admitted, and by-laws adopted.

Dr. J. C. Fuller tendered his resignation as one of the Executive Committee, which was accepted, and Dr. H. N. Lewis, of Quincy, elected to fill the vacancy.

The following members were chosen as delegates to the American Dental Association:—

Dr. Ormsbee, Geneva; Dr. S. Babcock, Springfield; Dr. A. C. Van Sant, Princeton; Dr. C. B. Rising, Rockford; Dr. O. Wilson, Aurora;

Dr. M. S. Dean, Chicago; Dr. A. E. Gibbs, Ottawa; Dr. J. H. Young, Chicago; and Dr. Griswold, of Morris.

Adjourned.

At a subsequent meeting of the Executive Committee, it was decided that the next regular meeting should be held in Chicago, on the second Tuesday in May, 1866.

EDGAR PARK, *Secretary*.

SUSQUEHANNA DENTAL ASSOCIATION.

BY J. W. KESLER.

THIS Association held its second annual meeting at Wilkesbarre, Pa., July 12th and 13th, 1865.

President, Dr. J. M. Barrett, in the Chair.

Members present: Drs. G. M. Renn, R. E. Burlan, John Locke, J. D. Wingate, C. S. Beck, E. C. Kester, E. D. Williams, H. Gerhart, W. A. Chittenden, and James W. Kesler.

Dr. H. W. Bessac was elected an active member.

The following gentlemen were elected honorary members: F. M. Johnson, Oliver Lund, T. H. Stockton, Geo. T. Barker, D.D.S., and T. L. Buckingham, D.D.S.

Dr. G. M. Renn read essay, subject: "Qualifications of Mind for the Profession."

The subject of artificial dentures was then taken up.

Drs. Burlan, Beck, Gerhart, Wingate, and Williams were nominated as delegates to the American Dental Association.

Donations to the library were received from Johnson & Lund, Ruben-came & Stockton, and Dr. T. L. Buckingham.

The following officers were elected for ensuing year:—

President.—J. M. Barrett.

Vice-President.—E. C. Kester.

Corresponding Secretary.—E. D. Williams.

Recording Secretary.—J. D. Wingate.

Treasurer.—W. A. Chittenden.

Librarian.—James W. Kesler.

Association adjourned to meet at Sunbury, Pa., June 10th, 1866.

CONNECTICUT STATE DENTAL ASSOCIATION.

THE semi-annual meeting of the Connecticut State Dental Association will be held in the City of New London, on Tuesday, Oct. 3d, 1865.

The Executive Committee present the following subjects for discussion:—

- 1st. Treatment of irregularities, with exhibition of models.
- 2d. Means of controlling flow of saliva.
- 3d. Filling approximal cavities.
- 4th. Treatment of teeth with exposed nerves.
- 5th. Mechanical dentistry.

"Clinics" will be held from nine to ten, and from two to three, on Wednesday. Distinguished demonstrators will be invited to operate. Prof. J. H. McQuillen, of Philadelphia, has consented to deliver a lecture on the "Microscopy of the Dental Tissues," with illustrations, on Tuesday evening, at 7.30 P.M.

A full attendance is requested.

Samuel Mallett, John T. Metcalf, and H. J. Stevens, *Executive Committee*.

JAMES McMANUS, *Rec. Sec.*

HARTFORD, August 17, 1865.

AMERICAN DENTAL ASSOCIATION.

THE fifth annual meeting of the American Dental Association was held at the Opera House, Chicago, on Tuesday, July 25, 1865, and was called to order at eleven A.M. by the President, DR. J. H. McQUILLEN; DR. J. TAFT acting as Secretary.

On invitation of the President, Rev. Dr. Halsey opened the meeting by invoking Divine guidance and protection.

The Committee of Arrangements, consisting of Drs. Allport, Bogue, Dean, and Haskell, then presented a report on credentials, recognizing the following named gentlemen as delegates from their respective Societies:—

The list of delegates to and permanent members of the Association, being now called for, was read as follows:—

Brooklyn Dental Association.—W. H. Atkinson, C. P. Fitch, G. A. Mills, W. C. Horne.

Buffalo Dental Association.—G. B. Snow.

Beaver Meadow Valley Dental Association.—T. J. Chandler.

Central States Dental Association.—W. H. Morgan, B. M. Gildea, G. B. Fittz, J. L. Nourse.

Central New York Dental Association.—John E. Savery.

Chicago Dental Society.—J. C. Fuller, A. W. Freeman, M. W. S. Sherwood, J. A. Kennicott, E. R. E. Carpenter.

Cincinnati Dental Association.—H. A. Smith.

Connecticut State Dental Association.—W. W. Sheffield, A. Hill.

Connecticut Valley Dental Association.—W. H. Jones.

Delaware State Dental Association.—B. J. Bing.

Hartford Society of Dentists.—J. McManus.

Hudson Valley Dental Association.—J. N. Scranton.

Illinois State Dental Association.—S. Babcock, A. C. Van Sant, C. B. Rising, O. Wilson, M. S. Dean, A. E. Gibbs, E. H. Kilbourne, J. H. Young, N. R. Griswold, Edgar Park.

Indiana State Dental Association.—M. Wells, P. G. C. Hunt, D. M. Weld, J. Richardson.

Iowa State Dental Association.—H. S. Chase, G. W. Nichols, E. L. Clark, J. P. Porter, N. H. Tulloss.

Kentucky State Dental Association.—W. G. Redman, W. D. Stone.

Merrimack Valley Dental Association.—A. Lawrence, G. A. Gerry, J. D. Kilbourne.

Mad River Valley Dental Association.—A. A. Blount, G. L. Payne, N. W. Williams.

Massachusetts Dental Association.—L. D. Shepard, B. S. Codman, I. J. Wetherbee, H. F. Bishop, J. A. Salmon.

Mississippi Valley Dental Association.—W. H. Sedgwick, W. Taft, W. P. Horton, G. W. Keely.

Michigan State Dental Association.—J. A. Watling, C. B. Porter, H. H. Jackson, J. A. Harris, B. Bannister, G. W. Stone, G. L. Field.

New Haven Dental Society.—J. H. Smith, E. Strong.

Northern Ohio Dental Association.—C. C. Carroll, C. H. Harroun.

New York Society of Dental Surgeons.—John Allen, W. C. Tinker.

New York State Dental Delegation.—Jesse A. Perkins.

Ohio Dental College Association.—J. C. Dean, G. H. Cushing, Geo. Watt, A. Berry, A. S. Talbot.

Pennsylvania College of Dental Surgeons.—T. L. Buckingham.

Pennsylvania Association of Dental Surgeons.—Spencer Roberts.

Philadelphia Dental College.—J. H. McQuillen.

Southwestern New York and Northwestern Pennsylvania.—J. C. Gifford.

St. Louis Dental Association.—W. N. Morrison, I. Forbes, H. E. Peebles, Henry Baron.

Wabash Valley Dental Association.—A. M. Moore, I. Knapp.

Western Dental Association.—C. W. Rivers, S. L. Edwards, J. W. Ellis, D. W. Perkins, H. N. Lewis, G. S. Miles, T. P. Abel.

Western New York Dental Association.—A. P. Southwick, E. H. Danforth.

Old Permanent Members.—Drs. C. W. Spalding, J. H. McQuillen, T. L. Buckingham, G. A. Mills, W. H. Atkinson, C. P. Fitch, W. W. Allport, I. J. Wetherbee, J. Chesebrough, J. C. Dean, L. D. Shepard, W. O. Kulp, I. Forbes, S. B. Noble, W. D. Stone, H. E. Peebles, W. N. Morrison, F. N. Seabury, J. H. Smith, T. P. Abell, E. Strong, J. McManus, E. A. Bogue, C. B. Porter, H. F. Bishop, L. P. Haskell, G. B. Snow, Henry Barron, J. A. Perkins, J. Taft, Geo. Watt, B. M.

Gildea, John Allen, F. Y. Clark, Chas. R. Butler, W. P. Horton, P. G. C. Hunt, A. Blake, P. Harris, S. G. Martin, A. B. Robbins.

New Permanent Members.—Drs. J. C. Fuller, N. H. Tulloss, H. Barron, J. A. Salmon, G. A. Gerry, C. B. Rising, A. E. Gibbs, A. Lawrence, M. S. Dean, G. B. Fittz, A. Berry, J. C. Gifford, A. P. Southwick, W. C. Horne, J. L. Nourse, W. H. Gates, B. S. Codman, C. W. Rivers, H. S. Chase, W. W. Sheffield, W. H. Jones, S. Roberts, O. Willson, C. H. Harroun, H. N. Lewis, W. C. Tinker, G. W. Keely, W. G. Redman, A. C. Van Sant, J. H. Young, A. W. Freeman, J. A. Kennicott, E. R. E. Carpenter, E. L. Clark, E. H. Danforth, T. J. Chandler, M. Wells, S. Babcock, N. R. Griswold, W. H. Morgan, S. L. Edwards, E. H. Kilbourne, A. Ames, W. W. Ormsbee, A. A. Blount, D. M. Weld, G. H. Cushing, W. Taft, A. Hill, J. D. Kilbourne, G. L. Paine, N. W. Williams, J. A. Harris, J. P. Porter, C. C. Carroll, W. H. Sedgwick, G. W. Nichols, I. Knapp, B. Bannister, G. S. Miles, G. L. Field, J. Richardson, D. W. Perkins, J. W. Ellis, A. S. Talbot, G. W. Stone, H. H. Jackson, J. A. Watling, E. Park, J. N. Scranton, B. J. Bing, M. W. S. Sherwood, J. E. Savery, A. M. Moore, S. B. Noble, M. Mills, H. A. Smith, C. H. Forman, H. McCullum, A. P. Sayles, W. H. Shodoran, Geo. P. Lund, S. D. French.

The report of the committee was adopted.

Dr. Allport then read the following Address of Welcome to the Association:—

Mr. President, and Gentlemen of the American Dental Association:—

In bidding you welcome to the City of Chicago, on an occasion so interesting and auspicious to our profession as the present, it may not be deemed inappropriate to the time and place of our meeting, to indulge in a brief retrospect of the past.

In the summer of 1859, twenty-five members of the dental profession met in convention at Niagara Falls, to consult together as to the expediency of forming a National Association upon the representative basis. All, I believe, who were present, felt that if such an association could be formed, and should receive the sanction and co-operation of any considerable portion of the better class of practitioners, the best interest of the profession would be promoted, and great good result to the public.

The number of State or local societies, then existing, to send delegates to the annual meetings of an association of this kind, was so very limited that but few even of the small number present felt at all sanguine of the ultimate success of such an enterprise. But in view of the many great and good results anticipated from such association, in case it should be crowned with success, and in the hope that the formation of local societies would be stimulated thereby, it was determined to take the initiatory steps for the organization, deferring final action until the following year.

At the appointed time, July 31, 1860, *twenty-three* delegates only, of the various dental societies and colleges then existing, met in the City of Washington, and the American Dental Association was organized, and entered upon its work. Five years only have passed, and from what was a small and doubtful beginning, by the steady and well-directed efforts of those who were instrumental in its formation, this Association has become one of the most successful enterprises of the profession, and one of the most useful and influential dental societies in the world.

Of the professional standing of those who have attended as delegates, the annual meetings of this Association, and have been accustomed to take part in its proceedings, it is not necessary for me to speak. They are universally acknowledged as standing among the most scientific and successful operators of our time and country, and as belonging to the class *Progressive*. The essays and discussions of the members of this Society have passed into the literature of our profession and become a part of its history. In point of ability they have been by far the ablest and most instructive that have ever emanated from any body of dentists in our country, and will suffer little, if any, in comparison with the essays and discussions of the American Medical Association. Should this Association adjourn *sine die* to-day, and never hold another meeting, sufficient good has already been accomplished by it to fully vindicate the wisdom and foresight of those who first projected it, and have done the most to sustain it.

As we cast our mind's eye over the history of dentistry, and see how in the last forty years, it has risen from a tinkering, catch-penny calling to the dignity of a noble profession, in whose ranks may be found men of high moral and scientific culture, commanding alike the confidence and respect of the educated and refined, we can but attribute much of this progress and pleasing results to the influence of our various local and national associations. All of these associations have their influence for good, and are important, but none is so well calculated, in every respect, to allay that spirit of jealousy and distrust in each other—none so well calculated to strengthen the bond of a common interest and brotherhood, that should bind the profession of the East with the West, the North with that of the South, and make all to feel their mutual dependence upon each other, as a representative National Association. In it are embodied the principles that underlie the structure of our national government, which has demonstrated to the world that for the protection of a community of interests, or for the development of resources, whether material or *mental*, no organization or government is so strong as that based upon the principles of a representative Republic.

You are all familiar with the advantages of association and combined labor in the various avocations of life, no matter whether it be in mental or physical labors. You assemble here to-day, as delegates and members

from different parts of our extended land, and in the discussions here elicited you will find new illustrations of the old familiar truths that "knowledge is power," "union is strength," and "in a multitude of counselors there is wisdom." By the contact of mind with mind both will be strengthened, and embryo ideas and theories will be developed into full maturity. "There is a magnetism in such contact, full of creative energy. Flint and steel are passive in themselves, but clash them together and they give out fire, and brightness dazzles upon the sight. The positive and negative poles of a battery never come together without a *result*. By friction of different mental organizations together, an idea is evolved, a new law is discovered, a new creation is added to the wealth of knowledge, and the long-coming rays of a new truth, like those of a far-off star in the laboratory of heaven, reach and illumine the world."

Gentlemen, this Society was organized for a purpose. Its mission is not yet fulfilled. It has a great work yet to do—a destiny to accomplish. The men who were instrumental in its formation were not discouraged because it was so small and unpromising at first. They knew that in the profession it had a strong and vigorous mother to nurse it, and that its growth was certain, but they did not expect it to mature so rapidly. Nor will those who are now engaged in it be so elated by its unexpected success as to allow it to sink under that supine and careless indifference, which so often follows prosperity. Its course will be onward and upward—its motto, Union and Progress.

As the scourge of war passes away from our country, and peace "with healing in her wings returns to bind up a nation's wounds," and those who have hitherto stood arrayed against each other in deadly conflict shall engage in the various pursuits of industrial activity; as that portion of our country which has been laid waste by the desolating hand of war shall be rebuilt, and the millions, North and South, in trust and harmony, shall once more labor to develop the untold treasure of our broad domain, we may look forward to a period of unexampled prosperity in the history of our country.

The rich cotton plantations and rice fields of the South, with the broad prairies and fertile valleys of the North, shall yield an abundant reward to the freeman's hand; the slave-pen and human auction-block shall give place to the church and the school-house; with human slavery, the source of all our troubles, forever extinguished from our land, honest pay shall be awarded for honest toil, and we may look for a season of prosperity such as the country has never known.

Wealth, education, and refinement will become more general; and our profession will be called upon to administer to the wants of a higher civilization. As specialists in medicine, to ameliorate suffering and contribute to these wants should be our aim.

To be the better prepared to do this we should divest ourselves of all

selfishness and vanity of opinion; and with uncovered heads drink of the fountain of knowledge, from whatever source it may flow. We should measure ourselves with ourselves, not to show that one man is stronger than his fellow, or to pull down those who have been more successful than ourselves, but to give just confidence to the timid, and to strengthen and raise up the weak. None should be ashamed to learn, or afraid to teach. Freely to give and freely to receive should be our object.

Some of you, before reaching home, will have traveled thousands of miles to attend this meeting. It may be you have come burdened with the rich treasures of experience and skill, to lay them upon the common altar of your profession, for others' good; or it may be you have come to drink from the fountain of thought which others have prepared for you. Here, as ever, he who would freely receive should freely give. And here, too, the "widow's mite" is as acceptable as the rich man's treasure. Whether you have come to give or to receive, gentlemen, as Chairman of the Committee of Arrangements of the American Dental Association, I bid you welcome to the Garden City of the Lakes—to the Commercial Metropolis of the Northwest.

Many of you visit to-day, perhaps for the first time, the City of Chicago. As you walk our streets, and see our magnificent and well-filled stores, our palatial residences, our splendid churches, our model schools and colleges, our grain elevators and warehouses—the largest in the world—our shipping, our railroads, branching out in every direction, our magnificent Chamber of Commerce, with its massive and solid proportions, and this artistic and imposing opera building in which we meet; as you look around and see here the largest grain depot on the continent, a city stretching out for miles in every direction, with a population of two hundred thousand souls,—it may not be amiss for me to state that it is not yet thirty years since Chicago was known only as a military post with a few Indian traders, who were supplied with the comforts of life from the East.

The very spot on which we are assembled to-day, in this splendid temple devoted to the fine arts, in the centre of this great commercial emporium, thirty years ago was but a hunting ground covered with prairie grass, through which the Indian pursued his game.

And yet last year our city sent forward to the seacoast and to European markets nearly fifty million bushels of grain, enough, if placed in freight cars, to make a train extending almost to the City of Philadelphia. The growth of only a quarter of a century has made Chicago the largest original grain market in the world, not excepting Odessa, the famous grain market on the Black Sea.

From whence comes this prosperity—this rapid growth? It may all be told in one word, and in it is taught us an important lesson—*Enterprise—Enterprise!*

To Chicago, then, as the metropolis of Illinois, and to Illinois, the

leading State of the great Northwest, I again bid you welcome. The soil on which you stand to-day is too new to boast of ancient or classic memories, yet it is rich in the most sacred and patriotic associations. It is the home of statesmen, heroes, and patriots, that have stood forth nobly in defense of the institutions founded by our fathers, and whose fame has gone forth over the whole world.

In the suburbs of our city, on the shore of Lake Michigan, you will stand by the grave of the gifted and patriotic Douglas, whose eloquence once thrilled our halls of legislation, and who, dying just as the greatest rebellion the world has ever known was bursting upon the nation, left as an inheritance to his children, and to his countrymen a legacy, which so long as time shall last, shall stand out brightly on the page of history, the immortal words, "Tell them to obey the laws and support the constitution of their country."

And here, too, in his quiet Illinois home, engaged in the duties of civil life, was found the great soldier and military leader, whose genius and heroism, after carrying the armies of the Republic through the bloody battles and victories of Donelson, Shiloh, Vicksburg, Chattanooga, Spotsylvania, and Richmond, finally won for us an honorable and lasting peace, and made the name of Grant immortal as is the history of his country, and of whom it may be said, as of one of England's great leaders, "he never fought a battle that he did not win, and never encamped before a city that he did not take."

And, finally, in this city, five years ago last month, in a building erected for the purpose, and which is still standing, was placed in nomination for the Presidency, Illinois' honest and cherished son, whose sagacity and statesmanship guided our country safely through the perils of a gigantic rebellion, and whose untimely death left a nation in tears. Millions yet unborn will tread these streets, as they wend their way over the Western prairies, on their pilgrimage to the grave of Liberty's noblest martyr, ABRAHAM LINCOLN.

To our State, gentlemen, I again bid you welcome. Welcome to your duties—welcome to your pleasures—welcome to Chicago.

Dr. Abel then addressed the delegates in a facetious and interesting speech, in which he complimented the constituent societies, and offered a flattering tribute to their personal attainments; and set forth in glowing language the excellencies of the Dental Associations of the country, in contrast with the selfishness and ignorance of the past. He said they were traveling schools of dentistry, in which those who teach and those who are taught are equally instructed. Great as were the benefits they had conferred, their future usefulness was incalculable. Here the dentist may be professionally born again, and without these means he is well-nigh lost. The profession now occupies an elevated position in the eyes of the world; the disreputable stragglers who had heretofore clung to its

skirts will soon be dropped off, or, which would be far better, elevated to a respectability to which their efforts may entitle them. The doctor concluded by extending a hearty welcome to all present.

Dr. McQuillen, on the part of the Association, thanked the gentlemen for their kind words of welcome. He then directed attention to the fact that each delegate had come to this meeting as a *representative* of some society or institution, and it was important that every one should regard it as a *duty* to present the views of his section upon the various topics which would come up for discussion. Difference of opinion must be expected among independent minds; and their free expression, in place of retarding, was rather calculated to advance the interest of science; this was not to be accomplished, however, by a dogmatical presentation of views on the part of any one, but by a clear and argumentative mode of reasoning aiming to *convince* rather than to *overawe*. They had come hundreds of miles away from home: let each and all therefore turn out the silver lining of their manhood, that everything might be bright and cheerful, and nothing occur to disturb the harmony or interfere with the usefulness of the meeting. Let no personal misunderstanding or local difficulties, if there were such, be apparent here. In addition to the objects which the Society had in view, it should be remembered that every association *based* like it, on the *representative* system, whether established for the advancement of science, of religion, or the general good of humanity in other directions, were so many *links* in the *chain* calculated to bind together in the strongest manner possible every section of our beloved Union. If for no other reason than this, the cultivation of harmony was ever desirable.

The minutes of the last annual meeting were read and approved.

Dr. Spalding, of St. Louis, then moved the following resolution, which was adopted, namely:—

Resolved, That the physicians and dentists resident in this city, and also any others who may be here during the sessions of this Association, are hereby invited to be present and take seats with this body.

The selection of a Nominating Committee being in order, the following gentlemen, by the will of the Association, were appointed by the President:—

Drs. Geo. Watt, of Ohio; I. Forbes, of Missouri; A. Lawrence, of Massachusetts; G. A. Mills, of New York; Spencer Roberts, of Pennsylvania; W. D. Stone, of Kentucky; J. McManus, of Connecticut; C. P. Fitch, of New York; J. C. Dean, of Illinois.

The Committee of Arrangements reported the following order of business, which was adopted:—

Clinics, from eight to ten A.M.; morning session, from ten to one P.M.; afternoon session, from three to seven P.M.

On motion, adjourned to three P.M.

FIRST DAY.—*Afternoon Session.*

The Association was called to order by the President at half-past three. The minutes of the morning session were read and approved.

The report of the Nominating Committee being called for, the following names were presented as candidates for the respective offices:—

For *President*.—C. W. Spalding, St. Louis; C. P. Fitch, New York.

For *1st Vice-President*.—G. H. Cushing, Chicago; W. H. Morgan, Nashville.

For *2d Vice-President*.—Jas. McManus, Hartford; H. A. Smith, Cincinnati.

For *Corresponding Secretary*.—A. S. Talbot, Lexington, Kentucky; L. D. Shepard, Salem, Massachusetts.

For *Recording Secretary*.—J. Taft, Cincinnati; W. C. Horne, New York.

Treasurer.—I. J. Wetherbee, Boston; O. Wilson, Aurora, Illinois.

On motion, the report was accepted.

The election of officers for the current year being now in order, the following gentlemen were appointed tellers: Drs. Chesebrough, of Toledo, and Smith, of Cincinnati.

The balloting then proceeded, and resulted in the election of the following gentlemen to their respective positions:—

President.—DR. C. W. SPALDING, St. Louis, Mo.

1st Vice-President.—DR. G. H. CUSHING, Chicago, Ill.

2d Vice-President.—DR. JAMES McMANUS, Hartford, Conn.

Corresponding Secretary.—DR. L. D. SHEPARD, Salem, Mass.

Recording Secretary.—DR. J. TAFT, Cincinnati, Ohio.

Treasurer.—DR. I. J. WETHERBEE, Boston, Mass.

Drs. Fitch and Cushing were appointed to conduct the President elect to the Chair.

Dr. Spalding returned thanks to the Association, and said that he would discharge the duties of the office to the best of his ability, and with perfect impartiality; and in so doing he believed he would receive the support of every member of the Association. He then called upon

Dr. McQuillen, who delivered an oral address, of which the following is a synopsis. The doctor said that in retiring from the Chair he was deeply sensible of the kindness with which during his term of office all deficiencies had been overlooked, and for the hearty support accorded to him. Having been appointed at the last annual meeting "To prepare and present at its next session a full history of the AMERICAN DENTAL ASSOCIATION from its incipency," he had concluded to embody this in his farewell address. Prior to presenting the history it was advisable, however, to take a brief retrospective glance at the efforts which had

been made to establish a national society before this organization came into existence. The first step toward such a society was made about twenty-five years ago, when Drs. Hayden, Harris, and other prominent practitioners met together and established the "AMERICAN SOCIETY OF DENTAL SURGEONS." The *basis* of this association proposed that there should be *acting* and *honorary* memberships. The candidates to the first submitting to an examination on the part of a committee appointed for that purpose. For a number of years considerable interest was manifested in its transactions by the members, and the prospect of future usefulness was bright and encouraging. Eventually, however, the unwarrantable authority was assumed of dictating to members the modes of practice they should pursue; internal dissension was the result, *amalgam* being the bone of contention; a number of members were expelled, others lost their interest in the meetings, and at last the society dwindled down until at the fifteenth annual meeting only *nine* members were present. This limited attendance convinced those present that every prospect of usefulness was gone, and the President, Dr. Townsend, in an address, advised that it should give place to a less exclusive organization. Resolutions were drawn up in accordance with this suggestion, and the *dissolution* of the society distinctly proposed; these were acted upon at a subsequent annual meeting; and thus after a brief existence, a society which had given the first impulse to associated effort among dentists was brought to a close. The antagonistic spirit which occasionally disturbed its equanimity had been regarded by many as the cause that led to this. But the correct explanation would be found in the fact that while losing some members, and the sympathy of many others, the society made little or no effort to secure the *young talent* and *energies* of the profession, and failing to receive fresh additions to its ranks it ceased to *grow*, and in accordance with an immutable law of nature, *repair* not being equal to *waste*, *death* ensued.

Succeeding this, the AMERICAN DENTAL CONVENTION was formed, as lax in its requirements as the former had been stringent; it admitted all applicants without any respect to qualification; both the educated dentist, and the man who had not been a month in a dental office, were on an equality there. This movement, however, was received with favor by the profession; and at the first two meetings in Philadelphia and New York, all went on smoothly and prosperously. After the next annual meeting, exceptions began to be taken to the Transactions as discreditable; and from 1857 to 1859, many articles appeared in the dental journals upon the subject. Although the doctor had nothing to do with *these* communications, he fully recognized the force of all the objections urged, as they were in accordance with his own conviction; under these circumstances, desiring to see an organization established which should fully develop the *talent* and *energies* of the profession in *every* part of the

Union, he prepared and published an article in the DENTAL NEWS LETTER, April, 1859, over the signature of JUNIUS, entitled "BASIS OF A NATIONAL DENTAL ASSOCIATION."

In this paper, which was read in full, he stated as the conviction of many of its former hearty supporters, that the later sessions of the Dental Convention had failed to meet the demand of the profession for a more accurate science and a more perfect art. Referring to its past history, he acknowledged that it had been instrumental in accomplishing a good work, by bringing together practitioners from various parts of the country, and in giving an impetus to the formation of numerous local societies. Its day of usefulness, however, was apparently passed; its absurdities censured with just cause; losing the support of its best men, its end seemed near at hand. He then *suggested* the superiority of a *representative* body for effecting a general improvement of the profession. To give it stability and character, and deprive it of any approach to a clique, it should be composed of delegates that had received their appointments from permanently organized dental societies and regularly constituted colleges, on the basis of one delegate for five regular members and one for each college faculty. To the objection that the number of societies was not sufficient, he urged the stimulus that such an association would give to the development of local societies; while in addition to the delegates there could be members by invitation, and permanent members who had at any time been delegates. Such was the basis of the American Medical Association, which had operated with the happiest results for years, and the representative principle that of our great National Union. Why could it not be the basis of an American Dental Association?

A short time after this appeared, he drew up the following memorial, and having secured a number of signatures in Philadelphia, duplicates of the memorial were sent to the local societies then in existence. It read as follows:—

"The undersigned, practitioners of dentistry, believing that a National Association of Dentists, composed of delegates from State, county, and local societies and dental colleges, would be calculated to promote the best interests of the profession, respectfully *suggest* to the dental societies and colleges throughout the country, the propriety of electing delegates to meet in Convention at the Falls of Niagara, on the first Wednesday of August, 1859, for the purpose of forming, if the assembled delegates shall deem it expedient, a National Association upon a representative basis."

The local societies responded promptly, and the signatures of some forty dental practitioners of Pennsylvania, Ohio, Michigan, and Illinois were appended to this. And subsequently delegates were elected by each society and college in accordance with it.

Notwithstanding the hearty indorsement thus secured, the paper of Junius and the memorial awakened such misapprehension, misrepresentation, and opposition in some quarters, that it seemed better to start a new society than attempt to reform the old one. With this understanding the delegates met in convention at Niagara at the appointed time, twenty-five members being present, and for prudential reasons deferred acting upon the plan of organization which was drawn up there until the next year, when, at Washington, by the adoption, with unimportant modifications, of the original plan as the constitution of the body, the Association was established, twenty-three members being present at the organization.

When the time came for the next meeting, at Cleveland, the war had burst in fury over the land, and the annual meeting was postponed. The Association assembled, however, in that city in the following year with only fourteen members present. At the next session, in Philadelphia, fifty-six members were present. At Niagara, last year, eighty-eight members were in attendance, and now, in Chicago, we number one hundred and twenty-four.

Another important fact that should not be lost sight of was, that at the *first* meeting of the delegates there were only *ten local Societies and institutions represented*; whilst at this meeting delegates were present from *thirty-four organizations*, and several more in existence had elected representatives who were unable to attend. Formed, as these additional local Societies had been, since the organization of this Association, they could be properly regarded as offsprings of this as a parent Society.

Thus this Association, conceived at a period apparently the most inauspicious; born when the spirits of evil were concocting the hell-broth of rebellion; and rocked in the cradle of adversity, had gained fair proportions, exercised a powerful influence in the profession, by stimulating *individual and associated effort*; and it was reasonable to infer that in a time of peace we might look for a larger increase of members, and a still more extended sphere of usefulness. We had met with a certain measure of success, and should not be unduly elated by it, but rather let it be the incentive to renewed effort; and so *act* and live that we might leave a bright example for those who follow us. We should encourage and favor the *young men*, for they were the *life blood* of societies, and it was to them we must look for the future progress and development of our profession. It would be folly to regard this organization as perfect; it answered the present contingencies, but the wants of the future might demand modifications: let those be met in the true catholic spirit. There were some who objected to changes; but what gave an appearance of life and freshness to the world but the constant changes in the face of nature in spring, summer, autumn, and winter? The death of the old was ever the birth of the new. That which was true of nature was also true of societies. In a constant but harmonious change of elements there was

vitality and utility. Above all things, they should avoid cliques, nothing tending more to mar the harmony, impair the usefulness, or hasten the dissolution of an association than by tolerating such combinations. Permit nothing of the kind, and cherish a true spirit of liberality. Finally, in the words of that noble man and blessed martyr, Abraham Lincoln, "with malice toward none, with charity for all, with firmness in the right, as God gives us to see the right, let us strive on to finish the work we are in."

Dr. Noble, of Chicago, offered a vote of thanks to the retiring officers for their labors. Adopted.

On the call for reports—

The report of the Treasurer was now presented, as follows:—

I. J. Wetherbee, Treasurer, in account with the American Dental Association.

DR.		
To Cash received of 88 Members	\$176.00	
Annual Assessments	18.00	
		————— \$194.00
CR.		
By Cash for Hall.....	\$28.00	
Stationery and Sundries	5.50	
Publishing Committee, as per order.....	160.50	
		————— \$194.00

The report was referred to an Auditing Committee, consisting of Drs. Shepard, Noble, and Buckingham.

The reports of Standing Committees were now declared to be in order.

The Committee on Publication were not ready to report.

The Committee on Prize Essays had no report.

Dr. Fitch, from the Committee on Dental Physiology, presented a report, which he read. The following is an abstract of it:—

He said that dental physiology related as much to those forces and functions which preside over the formative and disintegrative processes as to the specific functions of the teeth after eruption. This view renders imperative an intimate acquaintance with their several stages of development as well as of the purposes they subserve. Physiologists meet with insurmountable obstacles on carrying their investigations into the domain of living tissues. A very important question arises: how far does the mother contribute to dental structure? and how may abnormal results be prevented or removed? The nutriment which ministers to foetal life is carried through the arterial currents of the mother, and defective organizations will be produced just in proportion to the deficiency of appropriate vegetable and mineral elements here. Every tooth germ has incorporated into its very essence a force denominated the germinal or typical force, which determines the character of the tooth, and the proper manifestations of this force depend upon physical and mental conditions. The speaker then entered into a description of the composition of the enamel, dentine, cementum, and the dental pulp; an inquiry into the

contents of the dentinal tubuli, the existence of dentinal fibrili, and their nature, citing the opinions of eminent authorities for and against these theories; concluding that part of the subject thus: "If it can be clearly demonstrated that dentinal fibrils penetrate and traverse the tubuli of the dentine, the question which has reference to the origin of dentinal structures is at once fully explained and made luminous by the penetrating gaze of advancing science."

The view taken of the subject by the doctor points to two very important ends: *first*, of producing ultimately a perfect natural denture in regard to quality and character; *second*, the preservation of the dental organs to advanced age by the employment of such agencies as will protect against as well as arrest decomposition.

He appealed to the members of the Association to show themselves workmen that need not to be ashamed, and to be quick to censure that practice which for slight causes and for want of requisite skill, sacrifices the natural for the introduction of the artificial.

Dr. Atkinson desired to speak to the intelligent man, and claimed the attention of all earnest students of the nutrition of the enamel. Physiology is as provable as mathematics so far as it is a true physiology. Can there be infiltration of the lime-salts into the enamel after eruption? Unhesitatingly, yes. There is a process of nutrition consisting of appropriation and dissolution. At the point of development where the crown is formed, before the calcification of the root, the enamel may be riven into little rails, (enamel rods,) perfect pentagons, hexagons, quadrangles, or triangles. If there were no nutrition in enamel it could give no protection to the subimposed dentine. In case of loss of lime-salts from the enamel rods by the action of disease or medicines, they may be restored by the use of lime-water, rendering the enamel even more solid than before the softening occurred.

All organs are nourished, not as a whole, but in their individual constituency—their cells. The source of nutriment to all cells is the prepared food—mucous mass, infusorial mass. The dentinal fluid in the interglobular spaces is the food of the enamel entering at the base of the enamel rods, while the lime-salts, in solution in the fluids of the mouth, enter at their peripheral ends; hence the propriety of sleeping with the mouth closed. Dr. Fitch refers beautifully to the origin of being. The enamel is the crystal complete, and the analogue of the mineral, the dentine of the vegetable, and the pulp of the animal organism.

He who never suffered from a sense of his ignorance knows not how to appreciate knowledge when attained. It is very dangerous when a man says he can do anything to say he is a fool, and it cannot be done (that is if he looks at all honest), in these days of rapid progression. In his efforts to explain to his patients the philosophy of sensitiveness in dentine he had presented them the comparison of a frozen glove-finger to

represent a dentinal tube, which, while frozen, stands erect with its fellows as a healthy tube, the solution of lime-salts within its wall; by thawing the glove-finger at the closed end, thus allowing it to collapse when infringed upon, was represented the forcing of the contents of the tube down upon the sensitive pulp. When the instrument has removed all that is softened, the wall of the tube resists the force, and the column of fluid is not disturbed; hence the absence of sensation. When the contents of the tubuli are in a perfectly neutral state, the dentine can be cut with impunity, but when acidified, even though that be the normal condition in the individual, they will be sensitive when disturbed. The currental movements that produce acid, alkaline, and neutral conditions of the blood column, are the true causes of æsthesia, hyperæsthesia, and anæsthesia of dentine, no less than of other structures, examples of which currents may be presented in what we denominate compatibility and incompatibility between patient and operator: compatibility being present, physiological conditions develop themselves; incompatibility, pathological—the one coinciding with the well-being of the system, the other with its destruction. The reason why gold succeeds so well in saving teeth and is so kindly retained therein, in the vast majority of cases, is an example of compatibility between diverse bodies. The type, builder, or ghost of a tooth, holding a correspondential relation to gold, more kindly takes up its residence therein, thus displaying the propriety of restoring the exact contour of the tooth with gold, to satisfy the correspondence or compatibility.

Dr. Perkins. Describe the ghost of a tooth.

Dr. Atkinson. The ghost of the whole corresponds to the Government of the United States, whose dominion is over the States, these over the counties, these over the towns, and the towns over individuals; all these have ghosts whose spheres are limited by the lines indicated. The typical form is spherical, but this is modified by the presence of adjacent parts.

What is decay or solution? Simply the driving out of the systemic ghost; the results of which are that the lime-salts are dissolved and washed away, or held in protinaceous solution *in situ*. An example of this action is found in sozodont, one of the greatest curses that ever came on this land. The active principle of this compound is potash, which will dissolve the animal portion of the enamel. It should be anathematized far and near. We want neither strong acids nor strong alkalies. When we understand the physiology of one cell we have a foundation for a code of physiology which cannot be overturned.

The President then announced that the Association was invited to an entertainment at the residence of Dr. Allport, at nine o'clock.

On motion, adjourned to Wednesday morning at ten A.M.

SECOND DAY.—*Morning Session.*

The Association was called to order at ten o'clock by the President, Dr. Spalding.

The Auditing Committee reported the account of the Treasurer correct. The report was accepted and the Committee discharged.

Resolutions being then called for by the Chair, the following was offered by Dr. J. W. Ellis :—

Resolved, That the Publishing Committee be instructed to print the Constitution of the Association, as amended, with the official report of the proceedings of the present year.

Dr. Atkinson opposed the resolution. He did not wish the Constitution published until it could be thoroughly revised and correctly printed. The former Transactions had been exceedingly incorrect, members had been made to say the direct opposite of what they had said.

Dr. Perkins, of Albany, considered it very desirable that some of the members should be made to say the opposite of what they did say ; he therefore hoped the motion would prevail.

The resolution being put on its passage was carried.

Dr. D. W. Perkins now moved that Dr. McQuillen be invited to deliver a lecture on the Anatomy of the Eye before the Association, at noon. Carried.

Dr. Richardson, of Terre Haute, offered the following :—

Resolved, As the sense of this Association, that the one who first promulgates or publishes to the profession at large any discovery, appliance, or mode of practice, shall be recognized as the originator of the same.

Dr. Morgan, of Nashville, opposed any such action, as it was quite possible that the first announcement of a discovery might be made by one who was not the originator, and under this rule much injury might in such a case be done. He had himself suffered in this manner.

Dr. Richardson supported his resolution by the assertion that many practitioners had discovered processes which they had used for years, and then others claimed credit therefor after their publication. The object of the resolution was to induce every one to give to the profession the benefit of his own researches.

Dr. J. W. Ellis was quite willing that discoverers should have due honor, but this resolution made no competent provision for their protection. He took occasion to object that the time of the session should be occupied with discussions and addresses on organs which were not the objects of our practice. He thought we could be much more profitably employed than in hearing lectures on the eyes or toes. For his part he only wanted to understand fully the structure of the teeth and how they could be saved.

Dr. McQuillen replied that the objects and aim of this Association did

not appear to be thoroughly understood by some of those present. It was not established for the purpose of confining our attention *exclusively* to the consideration of the dental organs. The structure and preservation of the teeth was of course a primary consideration, but these organs, in addition, bore important relations with the other portions of the human economy, and it was a matter of great moment to the profession and the community that all dental practitioners should clearly understand them. It mattered not how thoroughly one might be acquainted with a *part* of the economy, his sphere of usefulness must of course be much less expanded than it would be if he understood the *whole*.

It was owing to the disposition on the part of the profession in the present day to become thoroughly acquainted not only with *our specialty* but *everything* that *appertains to it*, that has elevated our calling from a *mere mechanical occupation* to the *position* of a *liberal profession*. When taking into consideration how often ophthalmic affections have their origin in diseased teeth, it required little argument to prove that the dentist ought to be so well acquainted with the relations existing between these organs as to be able to give a rational and scientific opinion when called in consultation with a medical practitioner. It should also be borne in remembrance that with a single exception (and this was by the will of the Association) the lectures that were to be delivered would not occupy the time set apart for the sessions of this body, but during the interim between the morning and afternoon sessions, and in the evenings.

Dr. Lawrence moved a reference of the resolution to a committee of three.

Dr. Allport moved that both resolutions be laid on the table. The motion was adopted.

The report on Dental Physiology, made by Dr. Fitch, was now taken up.

Dr. McQuillen said that in entering on the consideration of this subject on account of certain views which were advanced yesterday afternoon, he felt that it was incumbent upon him in the first place to briefly define the marked distinction existing between the mineral, vegetable, and animal kingdoms. These were so spoken of as to rather tend to the adoption of erroneous views with regard to the relation which they hold one to the other. It has been said here that "all things differ but in degree;" he would suggest that *things* differ not only in *degree* but in *kind*, and that the *difference in kind* was so great that one *kind* cannot produce another *kind*.

When carefully examining minerals, vegetables, and animals, certain marked characteristics are observable in which animals and vegetables in certain particulars resemble each other, and differ entirely from minerals. On this account the former are spoken of as *organic*, from the fact of their possessing *organs* adapted to the performance of special functions. The mineral kingdom, not exhibiting this adaptation of parts to separate func-

tions, are denominated *inorganic*, and chemical analysis resolves them into those simple elements which admit of no further subdivision.

The *inorganic* and the *organic* differ from each other first in *origin*: inorganic bodies do not spring from a parent. The animal and the vegetable, on the contrary, are the offsprings of beings similar to themselves; and it appeared just to infer that every animal or vegetable must arise from an egg or seed—they also differ in *shape*, in *size*, in *chemical character*, in *texture*, in *mode of preservation*, and in *termination*. Again, organized bodies are found in two states or conditions: one, that of *life* or capacity for action; the other, that of *death*, in which all the vital action has ceased and in which disintegration succeeds as a natural consequence. Properly speaking, there was no such thing as life and death in the inorganic kingdom.

Although resembling each other in many particulars, the vegetable and the animal differ from each other on account of the *exclusive possession* by the latter of *sensation* and *voluntary motion*.

The doctor, after an extended and lucid exposition of these differences, said that the teeth as organic structures were subject to the law of waste and supply which prevailed in other parts of the economy, and that the *liquor sanguinis*, or nutrient portion of the blood, only passed into the dentinal tubuli. The circulation of this in the tubuli was effected by capillary attraction, and the elective attraction existing between the fluid and the tissue to be nourished, as there are no blood-vessels in human dentine. With regard to what are denominated dentinal fibrils, which some look upon as filaments of nerves on account of the appearance they present when viewing a section of dentine in the field of the microscope, he believed was nothing more than coagulated fibrin. In some recent experiments he had placed a few drops of blood under the microscope, and as coagulation proceeded, with the point of a fine needle he had been able, by moving it about in the fluid, to obtain shreds of fibrin which resembled in many respects the dentinal fibrils; he did not present this as positive confirmation of the position, but trusted that others would institute similar experiments.

The sensibility generally manifested by dentine when a foreign body comes in contact with it should be regarded as a *physiological phenomenon* rather than a *pathological manifestation*, the tooth resenting injury in the same way that any other portion of the economy would. There was a difference of opinion with regard to whether the painful impression experienced by the patient was due to *vibrations* communicated from the edge of the instrument along the dentine to the pulp, or to pressure of the instrument on the liquor sanguinis in the dentinal tubuli, being continued on to the pulp; he would not positively assert that the former was unquestionably the correct explanation, but it appeared to him much more satisfactory than the latter. It might be due, however, to both combined in many instances, if not in all.

Dr. Atkinson objected to some of Dr. McQuillen's positions. The great mistake of teachers is that they do not pronounce their ideas carefully enough. If we want to be understood we must define ourselves clearly. Capillary attraction is impossible in the case of dentinal tubuli, because only one end of the tubule is open. He who comes to dissect out a fresh tooth will find, upon splitting it transversely to the tubule, that the contents of the tubule will be stretched across the chasm in threads of greater or less thickness and consistency, in proportion to the distance of the separation of the fractured end of the tubules: when quickly snapped, the larger threads present us with globes upon the fractured end; when more slowly drawn out, the threads become attenuated and consolidated; and when fractured in some instances, curl back upon themselves, and in other cases remain straight. He doubted the existence of dentinal fibrils in a living tooth; he supposed them to be a post-mortem product.

Dr. Fitch said it was unfortunate for the profession that we have no correct terminology in which to express our ideas; hence when we talk, though we may not differ on the laws which govern organic forces, yet we misapprehend each other's language. As soon as we get into the field of speculation we find ourselves battling in the dark. It was well enough to dwell on basal truths, and to investigate the contents of the dentinal tubuli. There is force enough in the tooth to perfect the enamel and to preserve it, so with dentine, enamel, and the pulp. Dr. Atkinson had very wisely said that "the condition of the dentine could be changed by acid or alkaline action." When a normal condition is preserved, we have no pain, but as soon as a diseased condition is reached, sensitiveness is increased; the alkaline or acid condition might be reached by constitutional or topical treatment. He claimed that diseased action was but the sign of perverted nutrition. Physiology and pathology were so inseparable that he found it impossible to treat of one without running into the other.

Dr. S. Chase had long thought we were too much in the habit of looking on the surface of this subject instead of searching for the principles which underlie it. The study of dental physiology should commence with embryo life. Starvation, hereditary disease, and drugs are three monsters which leave their unmistakable footprints on the teeth of a large majority of the American people. Mothers starve the embryo by a lack of phosphates and carbonates in the *liquor sanguinis* which she gives to it. The infant is starved by the lack of nitrogenized products in the mother's milk. The child is slowly poisoned by an improper diet. Hereditary disease is a hydra-headed monster which works more injury to the dental organs than we can conceive. The use of drugs was an evil scarcely second in its devastations to any other cause. He urged that the dental profession should shake off the dust of the past and resolve

that for the future the charge of ignorance should no longer be valid against it.

Dr. J. W. Ellis spoke briefly, indicating the necessity of a better acquaintance with dental physiology, both on the part of the profession and the public.

Dr. Richardson thought the attention of the profession had heretofore been too much absorbed by chemical agents instead of defective nutrition during the period of the formation of the dental structure.

Dr. Perkins, of Milwaukee, referred the prevalence of diseased teeth to the habits and tastes of civilized society, which are enemies to the law of health. He said that so long as we deal with our artificial foods, candies, sauces, etc., we shall always have bad teeth, however much we may speculate about dentinal tubuli, capillary attraction, and dental assimilations. We must restore our race to natural conditions—simplicity of food and of tastes, and he was sorry to say he saw little hope of accomplishing anything of the kind.

Dr. Perkins, of Albany, did not consider the discussions practical enough; we were undertaking too much, more than we could at all hope to accomplish. If he had a cancer in his face, and a blood-blister on his toe, he would tell the surgeon to leave the blister and take care of the cancer. Too much time was taken up with these attenuations of dentistry, to the neglect of important practical matters.

The gentleman was called to order by Dr. Forbes, for irrelevantly commenting on the remarks of the previous speakers.

Dr. Perkins called for specifications.

Dr. Forbes could not find brains and wit both at the same time.

Dr. Perkins replied he thought it *would* trouble the gentleman.

Dr. Bogue, of Chicago, vindicated the present discussion, as those of previous years had been all within the practical range.

The hour of twelve M. having now arrived, Dr. McQuillen delivered a very able lecture on the Anatomy and Physiology of the Eye, illustrating his remarks with models and diagrams. After referring to the source, the composition, and laws governing light, and minutely describing the anatomy of the organ and explaining the physiological phenomena connected with it, he directed special attention to the intimate relation of the nerves of the teeth with those of the eye, and to the sympathy existing between them, and also to the affections of the eye which were most frequently caused by diseased teeth. He then spoke at some length on the necessity of the dentist taking proper care of his eyes, and drawing upon a personal experience, referred to the kind of light that should be used to operate in, precautions to be observed to protect the eye from excess of light, as well as valuable hints with regard to the use of napkins, the position of the head of patient and operator during the performance of dental operations.

The Association then adjourned to three P.M.

SECOND DAY.—*Afternoon Session.*

President Spalding called the meeting to order at half-past three p.m., stating that the regular order of business was a lecture upon the eye, from Dr. Hildreth, in charge of the Government Eye and Ear Infirmary at Chicago.

Dr. Hildreth, having been introduced to the Association, gave a very interesting description of his mode of operating upon the eye for the cure of various diseases requiring surgical operations. His remarks, which were illustrated by models and diagrams, were listened to throughout with marked attention.

He concluded with a beautiful tribute to the art of dentistry, and said that it was certainly keeping pace with, if not advancing more rapidly than other specialties.

Dr. Fitch moved that a vote of thanks be tendered to Dr. Hildreth for his able and unique lecture, which motion passed unanimously.

The minutes of the morning session were read and approved.

The Association then resumed the consideration of Dental Physiology.

Dr. Chase was not content that our profession should remain a mere mechanical one. His ambition was that its members should be Dental Physicians as well as Dental Surgeons. The time was fast approaching when he whose ambition extends no further than to perform good operations on the teeth, "as he finds them," will be left so far behind, in the grand march of dental progress, that he will never be able to overtake the camp-followers of the noble army of intelligent practitioners. Patient and persevering efforts in the instruction of the public will certainly attain the objects aimed at. To accomplish the greatest good, a general movement must be made by the whole profession in this direction.

Dr. Taft said that Dental Physiology deserved our careful attention, and that we should study to improve the dental structure, by aiding as much as possible the building power. In the development and maintenance of any organ there is a presiding influence, and the question at once presents itself, Can we control this power? We find it in different degrees of vitality, sometimes strong and vigorous, turning to its own use every material which is presented; at other times so weak and delicate as to require the most careful supply of nutriment. He believed much might be done to influence this vitality. You may call it "the ghost" if you please; it is simply the life power. It is not always of the same size or strength. Can we make it grow? While much depends on the material supplied to the ghost, more must rest on the ability of the ghost itself. The power that built up the structures was frequently hedged about by influences which prevented proper natural development. We might sustain the influences at work in the production of dental

structure; we should do all that we can to set in motion the power that built up these structures. The life force does not grapple at once with the crude material, but the nerve force acts as an intervening influence and is susceptible of modification and increase.

Dr. Watt said there were four things too much for Solomon. Of these we know a good deal more now than he seems to have had any idea of; but there was one thing that was too much for us. It would be worth millions of dollars to the dental profession to know the operation of all the forces used in producing a tooth, and what influence external agents might have upon its formation.

In the case of the craw-fish, or the fresh-water crab, we were all aware that if it lost one of its arms another would grow in its place, and the body of the animal increasing in size at the same time the arm which was replaced would be larger than the one lost. How does the vital principle act in this case? There is surely something which acts as a model for the growth of the arm; a ghostly sac, perhaps, which is filled out by the development of the new arm.

Dr. Nichols thought that if we knew the constituents of the tooth, and knew what agents would produce them, it would be a very fine thing; but there were so many temperamental influences brought to bear upon these agents that we could do but little to improve the substance of the tooth by the crude material used for nutrition.

Dr. McQuillen remarked that in discussing the nutrition of tissues we must not overlook the fact that the food introduced into the body does not consist merely of a certain amount of crude *material*, but that in addition there was an amount of *force* present in it which was as important to the economy as the albumen, fibrine, caseine, gelatine, and the phosphates and carbonates of lime, etc.

The plant as it grows does not merely draw from the surrounding soil and atmosphere the materials inservient to its nutrition, but it also absorbs and retains the light and heat which it obtains from the sun. We have no better illustration of this fact than when throwing a piece of wood upon the fire, it burns and gives off light and heat, proving thereby that there was that amount of *force* resident in its structure. Or again, the coal which we throw upon our grates in the winter time, as it burns, or the carburetted hydrogen which illuminates this room at night, throw off an amount of light and heat which was obtained by the vegetable kingdom in pre-Adamic days.

The vegetable holds an intermediate relation to the *inorganic* world and the *animal kingdom*, in other words, the vegetable obtains from the soil, atmosphere, and the sun *materials* and *force* which the animal can appropriate as food; while man, feeding upon the vegetable and the animal, obtains the supply required for the purposes of his economy.

In former days light, heat, electricity, and magnetism were spoken of

as *imponderable substances*; but this was a misnomer, they are not *substances* but *forces*. Even those who recognize this distinction regarding and describing these forces as separate and distinct entities, made the subject difficult of apprehension, but of late they have come to be regarded by the leading scientific men of the world as *correlated*, *conserved*, or modifications of *one great force*. Thus when light or heat disappeared it was not annihilated, (for there was no such thing as annihilation of force or matter,) but an equivalent of force appeared in another form,—it might be electricity, magnetism, or vital force; thus the *force* obtained from the sun in the food which we eat was converted into *vital force* in our economy.

The seed or egg was developed into a plant or animal by the forces and materials which it obtained from without. Formerly the force was supposed to be resident in the egg or seed, and to have been derived from the parent. Such was not the case, however; the *governing principle* alone was derived from the parent, and was present controlling the operation of the *forces* and the proper disposition of the crude material demanded by the organism. This was true of vegetables, the lower animals, and man.

Dr. Hill said he felt extremely diffident in speaking to the subject under consideration before this body; nevertheless, so deep was the interest he felt in the subject, he could scarcely excuse himself in withholding his own contribution, however small it might be.

The subject is confessedly recondite, and difficult of solution, and he who shall strike the right cord—he whose intellectual scintillations shall emit a single spark to illuminate this dark subject—will be the man to whom he should feel personally grateful. Indeed, he scarcely knew why he should feel thus diffident, and perhaps he ought not to feel so much embarrassed upon a subject where we are all in the fog together. But such was his interest on this subject that he was unwilling to have it dismissed without a further effort at development.

Whether we regard the subject under the head of the *correlation of forces*, or *nutrition*, *spirituality*, the *vis medicatrix*, or whatever it may be, there was evidently a break or interruption of nature's beneficent intentions and purposes, which should lead us most carefully to inquire if there be not a remedy. On the one hand, there seems to be a power in nature ready to work, and on the other hand, ample material to work with; but how shall we bring them together? How shall we adjust their relations? With respect to the electric telegraph, we observe that if its long lines of wire be severed at a single point, such a break is fatal to its working. You may bring the severed points never so closely together, only so as they do not come in contact with each other, and no effect is produced. There are certain conditions and relations which *must* be met before we can realize the desired results in the matter under

consideration; and who shall tell what they are, and how to meet them? Who shall supply the missing links in this wonderful chain of occult causes, so as to make them available in dental practice?

I have long been of the opinion that the medical profession have committed a grave mistake in so long ignoring in practice the higher and nobler elements of man's nature.

They have too long treated him as an *animal* merely, speaking in general terms. Some, indeed, have treated him as an *intellectual* animal, and some, going still a step farther, have accorded to him his crowning excellence as a *spiritual* being. And it seemed to him that without a distinct recognition of these great truths, we shall fail to meet the just demands upon us as members of a high and noble profession.

He liked the ideas presented by his friend, Dr. Atkinson, in his peculiar and unique style. There was much in what he calls "compatibility" between operator and patient; and the influence of the "good angels," or the inspiration of the *highest* and *purest* motives. And I most firmly believe that the dentist who shall bring to the performance of his duties the inspiration of love to God and his fellow-man, with an unshaken purpose to discharge them to the best of his ability, will have met the highest conditions that are possible in his case.

He feared that his remarks might be somewhat crude and incoherent, but so deep was his interest in the subject that he could not withhold an expression of his feelings and views upon it.

Dr. Perkins said that Dr. Buckingham had a carefully prepared paper upon the subject, and moved that he be invited to read it.

Dr. Buckingham preferred not to read it at that time, but made a few remarks upon the forces used in the production of dental structure. He said that chemical changes were constantly taking place, and that we should study and take advantage of these chemical forces, if possible, for the production of better teeth. There are forces that would assimilate the crude materials and exert an influence upon all the human structures.

He was not and never had been a spiritualist, and did not think it our duty to spiritualize but to investigate, and continue our researches for facts. He opposed the views expressed by Dr. McQuillen as tending to mere materialism, making nature God, and undermining the belief in any power save the natural forces.

Dr. McQuillen said: Mr. President, I fear I have trespassed already too far upon the patience of the members of this Association. I also recognize that according to parliamentary usage I have no right to speak again on this subject, but I would esteem it a favor to have an opportunity to respond to the remarks of the gentleman who has just taken his seat.

On motion, the privilege was granted, and the doctor proceeded.

There was nothing, he said, that had tended more to retard the prog-

ress of science than the cry of materialism and infidelity when some new fact or theory was presented which the world was not prepared to receive. For daring to assert that the world moved, and thus setting himself up in opposition to the dogmas of the day, Galileo was seized, by order of the Inquisition, and upon his aged and trembling limbs compelled to recant; but as he did so he whispered, "It does move." Within the past century, when geologists first asserted that the world was more than six thousand years old, the cry of materialism and infidelity was raised, and great opposition was made to it; but the facts were so numerous, so easy of demonstration, and so irrefutable, that the position could not be controverted. It was then found that the discrepancy was not between the *geological* and *Biblical record*, but in *man's interpretation* of the latter. And now pious, learned, and eminent divines, in place of opposing the geological record, draw some of their strongest arguments from it in support of the Scriptures.

Within the past few years the discovery in the Swiss lakes, in the quarries of France at Neufchatel, on the banks of the Mississippi near Natchez, and other parts of the United States, of human fossil remains and implements, seemed to indicate a higher antiquity to man than has heretofore been accorded to him. In opposition to this again has been raised the cry of materialism, but if the facts should prove unquestionable, there is no alternative but to accept the conclusion as true. With all this, those around him were no doubt familiar, but it was something new and passing strange that such objections should be urged against the views at present entertained in regard to the correlation, conservation, or conversion of the forces, supported as they are by Liebig, Groves, Farraday, and the reverent Carpenter, who, in his work on Human Physiology, makes constant reference to an all-wise and overruling Providence. The day had passed when observers and teachers were imprisoned or burned at the stake for advancing that which men regarded as false and materialistic; the flesh was no longer tortured, but the spirit was, by the pointings of the finger and the use of such epithets, and this had so intimidated some men that they have ceased to labor in fields which might have resulted advantageously to the world. It was a source of congratulation, however, that there were some restless minds so constituted that they were not affected by such things or content merely with knowledge that has been acquired, but they must be constantly reaching out into undiscovered fields, seeking for more light. Columbus discovered a new world because he believed that there was one to be found by starting on a voyage of exploration, and thereby augmented immeasurably human happiness, and changed the purposes and prospects of society.

This morning he had carefully described to them the human eye; for his part he wanted no better evidence of an all-wise and good Creator

than was presented in that organ, so beautiful and so perfect in its structure and adaptation to the ends for which it was formed. The operations of God were not those of chance; they are governed by fixed and immutable laws, and the *materials* and *forces* which had been referred to were the *agents* through which our Creator's works are accomplished. The geologists and other scientific men who in a reverent spirit prosecute their studies and give instruction from the book of nature were, in his estimation, as much the high priests of God and as usefully employed as those who teach from the written record.

Dr. Buckingham instanced many men of great learning who might be called priests of nature, but who denied the very existence of God.

Dr. Atkinson took exception to Dr. Watts' craw-fish. He said some men talk as if they had read everything, and as if they were the conduit through which all wisdom vouchsafed to mortals condescended to flow. He was not such a fool as to assume that as his condition; he only knew in part. Let us interrogate nature, and we shall see in regard to this replacement, the works by general and by special plans. In general, the organs not lost are held in abeyance, while the one is being brought up to their standard when they take up their line of march together. In some special examples and peculiarities of condition, the general growth will not be wholly arrested in the interest of the newly produced member, but go on in development and growth at a slower pace. Take the example of the tadpole or pollywog, an embryo frog, holding within itself all the possibilities of mutations of body, from the simple germ or egg to the fully developed frog; the stages of which depend upon enabling circumstances, light and heat being the indispensable conditions, in commensurate degree, to complete development. We can indefinitely postpone the change of gills for lungs by exclusion of light, and incredibly hasten the rapidity and completion of these stages by increase of heat. Whenever postponed, the tadpole becomes immensely developed in size; when hastened, the proper appropriation of elemental food not having had time to be assimilated to *its proper body*, we are presented with a miniature frog, who, to attain the normal size of his species, must occupy the equivalent of time and use the quantity of food necessary to accomplish that result. After his hind legs are cut, he can hop a little, and at that stage we will cut his tail off. Now for the man who says the tail will keep pace with the rest of the growth! The arms will remain *in statu quo* till the tail is developed.

Dr. Watts did not mean to convey the idea that the crab was in as good condition during the period of reproducing the lost member; but he knew from observation that the crab would grow during that time, and if the authorities disputed it, so much the worse for the authorities.

Dr. T. L. Buckingham read a paper on the Development and Reproduction of Animal Tissue, of which the following is an outline:—

Making mere mention of the various theories that have been advanced as to the development of animal tissue, and noticing in particular that held during most of the last century,—that the fibrine of the blood developed itself into fibres, and from them all the various tissues of the body were formed,—the doctor proceeded to expound the cellular theory as now generally held. Quoting from Virchow, he says no development of any kind begins *de novo*; and consequently rejects the theory of spontaneous generation just as much in the development of individual parts as of entire organisms. “Where a cell arises, there a cell must have previously existed; just as an animal can only spring from an animal, a plant only from a plant.”

Describing a cell as a sac containing a fluid, also, in most cases, a nucleus, and a nucleolus, and as being the lowest form of organized structure, he proceeded to detail its modes of nourishment and reproduction. The nourishing fluid passes through the membrane into the sac where it is changed by the life force of the cell, and a portion appropriated to its own use, while the remainder is discharged again. In this manner all tissues are nourished, as well as built up during their formation. The nerves may send a force to stimulate the cells to action, and the blood-vessels carry the fluid necessary to support them, but the power of appropriating this nourishment resides in the cells themselves, and hence they are to be considered the active parts of organized tissue, the inter-cellular structure being passive. Cells may be reproduced by two processes: the parent cell may contain a number of nucleoli, which may grow into cells, and as they enlarge burst the parent cell and escape; and this process may be repeated in the new cells, which are thus produced very rapidly. Secondly, a cell may become contracted in the centre till subdivision takes place as in the lower orders of plants, where each cell becomes an individual plant, living and acting alone, and precisely similar to its parent; but in the higher forms of life, where the plant or animal is composed of cells of different kinds, a more complicated process is carried on. By following the changes through which a plant passes from the seed to maturity, it may be seen when the different cells are produced. In the seed there are roots, stems, and leaves already formed; these develop according to the nourishment they receive, until a new class of cells is formed from them, which produce the flower and the fruit; and no one of these individual parts is capable of forming a cell that will produce the fruit; this must be done by two of them uniting and forming a compound cell which is capable of reproducing the plant.

Taking the highest class of animals—in the female a small cell is developed in the ovary, which has no power of reproducing other cells, or of living for any great length of time itself. But if this cell come in contact with a sperm cell from the male, the two coalesce, and the compound cell has the power to reproduce cells, and these again cells differing

from themselves, until the organs have acquired sufficient size and shape; and then the reproduction of cells is limited to the number required to keep the organs in their normal condition. When a new organ or tissue is required, then a cell is created by the action of other cells differing from them in its functions. How or why this new creation takes place is not known, but Nature, where necessity requires it, always has a way of accomplishing her designs. As an example of this fact, the doctor referred to the production of the queen bee. In man and the higher order of animals, the power of restoring lost or injured parts is very limited; but in plants and the lower order of animals it exists to almost an unlimited extent. In man, bones, cartilages, blood-vessels, and nerves are frequently reproduced to a surprising extent; while muscles and some of the organs of the body, when once lost, are seldom if ever reproduced. In the lower order of animals not only parts of an organ may be reproduced, but a whole organ; and that too when it appears to be a most essential one to the existence of the animal.

In conclusion, the doctor stated as the main points of his paper:—

First. All tissues are formed from cells, and these from parent cells; also, that the cells are the active parts of all tissues, the intercellular structure being passive.

Second. Cells invariably produce cells similar to the parent cell, except when new organs are required, and then a new cell, differing from those which produced it, is formed.

Third. As new tissue is formed from cells, so repair or reproduction of tissue is also produced from cells.

Fourth. The cell being the active part of the tissue, all changes, either in health or disease, take place through it.

Dr. Atkinson took up the reference in the doctor's paper to the birth of the queen bee, and explained very minutely the measures which the working bees take on the death of their queen. He opposed the statement that bone can produce periosteum. True bone-cells never come from cartilage.

Dr. Buckingham asked how a bone could be covered with periosteum when that had been removed. If a necrosed bone was removed, the periosteum will produce a new bone.

Dr. Atkinson replied that periosteum was but the partition between soft and hard tissues; it was not a bone producer nor a bone nourisher.

Dr. Buckingham responded very briefly.

Dr. McQuillen said that periosteum could not produce bone, or bone periosteum, and that all tissues are produced and formed from and by cells.

The President announced that the committee selected Drs. Atkinson, Fitch, McManus, and Spalding to conduct the clinics, to commence at eight o'clock this morning.

Dr. Allport announced a lecture by Professor Brainard, to take place at eight o'clock, in the evening, on Specialties in Medicine.

Also that the Association was invited to an entertainment at the residence of Dr. De L. Miller, this evening at nine o'clock.

Dr. I. J. Wetherbee, of Boston, moved that the next annual meeting of the American Dental Society be held at Boston.

Dr. Morgan, of Nashville, moved that it be made the special order for to-morrow morning at ten o'clock. Carried.

On motion, adjourned to Thursday at ten A.M.

LECTURE BY PROFESSOR BRAINARD.

A lecture was delivered in the evening in the Opera House building to the members of the Association, by Professor Brainard, of Rush Medical College, upon the special branches of medical and surgical study. The lecturer sketched the rise and progress of dentistry as a specialty, from the time when it was considered a mere mechanical art, to the present time, when it has developed itself into a most important special branch of the medical profession. He did not mean to be offensive, he said, in referring to its mechanical origin; for his own specialty, surgery, in the 14th and 15th centuries was left entirely in the hands of barbers, who united the practice of surgery with their tonsorial duties, as it was regarded beneath the dignity of the medical man in that period. This rapid progress he considered in a high degree due to the fact of its having been studied as a specialty; men having devoted their entire time and attention to its pursuit. This special study the lecturer considered to be of great importance, worthy of consideration and adaptation in other branches of the science. He considered the path of progress in medical science to be by way of special study. By this he did not mean to advise the separation of the various branches, or to suggest that they should be distinct, one from the other. He believed that dentistry should not be separated from the profession, and hoped to see the day when there should be a chair for diseases of the teeth in every respectable college of medicine in the land. At present, all that is taught the medical student regarding the teeth, is confined to the period of dentition; that if the teeth of the infant do not come through, the gums must be lanced. This was not right, and would be obviated by the recognition of dentistry as a legitimate portion of the profession. Such a union would be highly beneficial to dentists, for it would place them in a position to acquire an extended knowledge which would prove of great use to them.

The lecture was heard with great satisfaction by the Association, eliciting much commendation; and at its close, the professor was requested to furnish a copy for publication in the Transactions of the Association; and a vote of thanks passed for its delivery.

(To be continued.)

EDITORIAL.

AMERICAN DENTAL ASSOCIATION.

THE report of the first two days' proceedings of the American Dental Association at Chicago, which is presented in another part of the magazine, will give some idea of the interest manifested by the profession in this organization. It was generally supposed that the meeting would be a large one, but few, if any, imagined that the attendance would be as large as it was. In addition to the one hundred and twenty-four members whose names are presented, there was a large number (some thirty or forty) of the profession present, who, not being delegates from any society, of course could not take part in the proceedings, but were entitled to a seat in the meeting by invitation of the Association.

The usefulness of this Society is not confined to the mere annual gathering of its members, but fostering and encouraging as it does the local societies already in existence, and the formation of additional ones, its influence is extended to the profession in all parts of the Union, and more or less felt during the entire year. There is no better illustration of this than the fact that since the organization of the Association *thirty* local societies have been formed, and it is trusted before another year rolls over that additional societies will be established, so that every State will be represented at the next annual meeting at Boston. Fifteen States were represented in this meeting, viz., Massachusetts, Vermont, Rhode Island, Connecticut, New York, Pennsylvania, Ohio, Michigan, Illinois, Wisconsin, Iowa, Missouri, Kentucky, Tennessee, and Georgia.

The length of the excellent and accurate report of the proceedings of the meeting at Chicago precludes the possibility of presenting it entire in this number; the remaining portion will be published next month. Leaving the transactions to speak for themselves, it is only necessary to state that the deliberations were characterized by the utmost harmony and good feeling.

The interest manifested by the leading medical practitioners of Chicago, many of whom were present during the sessions of the Association, as well as the kindness, courtesy, and warm hospitality received at their hands, will be long remembered with feelings of gratitude by the members of the Association.

J. H. M'Q.

BOOKS RECEIVED.

TRANSACTIONS OF THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN, FROM 1856 TO 1863 INCLUSIVE. Three volumes.

HUNTER ON THE TEETH. Edited by FRANCIS C. WEBB, M.D., F.L.S., and ROBERT T. HULME, M.R.C.S., F.L.S. London, 1865.

THE TEETH IN HEALTH AND DISEASE. By ROBERT T. HULME, M.R.C.S., F.L.S. London, 1864.

SELECTIONS.

DENTAL REVIEW—APRIL.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN. Monthly meeting, Feb. 6, 1865. THOS. A. ROGERS, President, in the chair.

"Remarks upon the Collection of Skulls in the Crypt of Hythe Church, Kent. By MR. SAMUEL CARTWRIGHT and MR. ALFRED COLEMAN.—This paper was read by Mr. Coleman. The chief object of the writers in visiting the above spot was with the view of making some comparison between old and recent maxillæ; after explaining how the bones were arranged in the crypt of the church, the tradition respecting the manner in which they had been collected was criticised, the writers inclining to disbelieve the idea that they had been collected after a great battle between the Danes and Saxons: from an examination of the skulls themselves, as also from the fact of there being a considerable proportion of the skulls of females and of children among them. The skulls indicated very various positions of their possessors in the social scale. Of the maxillæ, the remarks of the writers being directed chiefly to the superior bone, there being but comparatively few of the inferior, the alveolar arches were all well developed, there being in no case anything seen like the contracted arches, so common in these days; they were in their architecture Norman, like the church that contained them, the Gothic form appearing in both cases to be a later introduction. Measurements of both upper and lower jaws compared with modern skulls showed a greater width across in the former over the latter.

"The teeth, most of which had been removed from the jaws, were remarkable for regularity and quality. In size, they were little different from those of the present day; of their structures, the enamel was compact and evenly distributed over the dentine, which was dense and of the yellow variety, indicative of strength and durability. In a large proportion the masticating surfaces were much worn, and in some cases the pulp in consequence actually exposed. Caries existed, but to a far less extent than is seen in the present day; and mostly on the masticating surface; it had been in the majority of cases attended with alveolar abscess."

"On some Forms of Irregularity of the Teeth and their Treatment, considered chiefly in relation to Mr. Cartwright's Theory of the Influence of Selective Breeding upon the Development of the Maxillæ.—MR. COLEMAN read a paper upon this subject. The writer first alluded to the circumstances which had diverted the attention of the Society from Mr. Cartwright's valuable paper of last session, and prevented its being fully discussed by the members, and stated that the object of his paper was chiefly that of reopening a discussion upon the same subject.

"The most striking idea propounded by Mr. Cartwright was, he considered, that which attributed the existence of the narrow or contracted jaws to breeding in, and upon this question he thought it very desirable that the Society should pronounce an opinion. That contracted jaws were more common in the present day than formerly, he fully believed most practitioners would admit; but with the view of proving this point statistically he had made a number of observations at the St. Ann's Asylum at Brixton, and these, compared with the observations made by

Mr. Cartwright and himself at Hythe, showed that, while no single case of contracted jaw was seen among the collection of skulls at that spot, no less than seventy out of two hundred at the former had some form of irregularity arising from this cause. In attempting to test the truth of Mr. Cartwright's views respecting the influence of selective breeding upon the development of the maxillæ, and the opinion that the most refined and intellectual in appearance had a greater tendency to irregularity in the dental arches than had those who were wanting in these qualities, he had taken as a classification of the former, the form of crania that might be contained in a triangle the base of which would touch the vertex, and the apex meet below the chin, and where a vertical line would be nearly parallel to the forehead, base of the nose, lips, and chin; while the form of crania indicative of what would be termed low-bred persons, might be contained within a four-sided figure, and where a line parallel to the forehead, base of the nose, and upper lip, would, with one also parallel to the chin and lower lip, meet in an angle in front of the face. Taking these characteristics for a guide, he showed in a diagram that out of 200 individuals examined 68 were of the latter class, and of this number 57 had well-developed, 6 moderately well, and 5 had badly-developed dental arches; while of those whose appearance was indicative of good breeding, 75 in number, 7 only had well-developed, 16 moderately so, and no less than 52 had more or less imperfectly-developed maxillæ, with irregularity in the teeth. The same diagram also showed the quality of teeth belonging to each class, which was in the crowded arches very inferior to that seen in the well-developed ones. The sizes of the teeth in each class were also given; they were, upon the average, largest in the best-developed alveolar arches. There were two principal forms of contracted dental arch in the upper jaw, the one in which the teeth bore their due relationship to the maxillæ as regarded size, but where the palatal portions of the latter were developed in the form of a high and pointed arch, bringing, consequently, the alveolar process of each bone nearer together, and so pressing the teeth into the form of the letter V. The other where the maxillæ are not ill-developed, but are, as regards the contained teeth, not proportionably developed; the latter are consequently forced to take up irregular positions, sometimes being pressed into a V-shaped form, and at other times more or less overlapping each other. When the canine was erupted before the bicuspid, the former usually prevailed, when after the bicuspid it generally took up its position without the arch, keeping back the lateral incisors, which, in such cases, were usually bitten over by their lower antagonists. It was to the latter only of these forms of contracted dental arch that the writer wished to direct the attention of the Society, and he believed their cause might be explained from the circumstance that the permanent teeth are in these cases developed in a more vertical line (the vertical line alluded to in the description of the form of crania indicative of high breeding) than was the case in the well-developed dental arches, consequently, in the advance of the permanent teeth in such cases, there was not the usual development of the maxillæ in the anterior direction, and an insufficient amount of room was thereby afforded for the larger permanent teeth.

"In searching for the causes which produced maxillæ wanting in proportionate development, while the teeth retained, as regarded size, their average development, the writer believed that an expansion of those bones, or those portions of them, which contained the cerebral hemispheres,

probably led to a contraction of those portions of them which formed the face and base of the skull; but that such forms became hereditary by breeding in:—our notions of the beautiful being in favor of the form of crania holding these conditions. This question of breeding in, in its influence upon the development of races, was considered, and was stated to tend to lower the physical and raise the intellectual capacities of a progressing race, but to maintain with little alteration the physical qualities of a barbarous people.

“The treatment of these forms of irregularity could be conducted upon two principles. One, that of increasing the ill-developed alveolar arches, the other that of reducing the number of teeth they contained. Of treatment upon the former principle the writer could not speak favorably, as his efforts had only resulted in the expansion of the dental, not the alveolar arch, and that the personal appearance in the latter, although the dental arch became regular in form, was usually far from satisfactory, as an unnatural projection was given to the mouth, and a consequently plebeian expression to the face. He, therefore, most fully concurred with Mr. Cartwright in his opinion that in such cases the removal of some of the teeth would prove the best treatment.

“The class of permanent teeth that should be removed, and the period at which the removal should be accomplished, were questions involving much consideration. Under ordinary circumstances he thought it advisable to wait until the outline of all the teeth, the *dentes sapientiæ* excepted, could be readily made out.

“In the treatment of the lower jaw, commencing with the eruption of the permanent teeth, the writer said the principle he commonly acted upon was probably different to that usually adopted. In well-developed alveolar arches each permanent tooth occupied the place of its temporary predecessor, with, in addition, the space afforded by the development of the alveolar processes in the anterior direction, so that the only treatment required for them was the removal of any temporary teeth or stumps that were not shed before the appearance of their successors. The writer stated that the permanent canines did not, as was usually stated, occupy a portion of the space which the temporary molars possessed in excess of their successors, the bicuspid, for that was monopolized in the advance of the first molar; so that each of the six front permanent teeth were arranged in their more capacious arch precisely as were the temporary teeth in their less developed arch. The removal of other temporary teeth than their predecessors, to afford room for the permanent teeth, was, in the lower jaw, not only useless, but usually worse than useless, as by such a course the incisors were made to take a regular position, while the permanent canines were erupted without the dental arch, necessitating the removal of a tooth on each side of the jaw to allow room for the symmetrical introduction of the canines into the dental arch, whereas the removal of one of the permanent incisors, irregular from having had only their temporary representatives removed, would be all that would be required, and give a better form of arch than would be otherwise obtained, and noticeable only (on account of its missing member) to professional eyes. In the upper jaw the different sizes of the teeth rendered such a course of treatment undesirable, as producing a noticeable irregularity in the front of the mouth.”

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Death and Life (Concluded).—Extract from the “Renewal of Life,” and Clinical Lectures, by T. K. CHAMBERS, M.D., etc.—“The most active metamorphosis of the body possible, the highest possible development of life in every part, is **HEALTH**.

“The complete cessation of metamorphosis is **DEATH**.

“The partial cessation, or arrest, is **DISEASE**.

“In death the flesh goes on being decomposed as during life; but not being renewed, the form is lost entirely. In disease, decomposition goes on, but renewal flags, and the decomposing tissues are not sufficiently pushed out by new-formed substance. They are retained as part of the imperfect body—a sort of ‘death in life’—and are rightly termed by the pathologist ‘degenerate.’ They are generated, but not *re-generated*; they are generated in an inferior mould of form.

“Take as an example what happens sometimes to voluntary contractile fibre. We all know that if an animal’s limbs are duly employed, the muscles keep up their shape and their vigorous power of contraction; their tissue is of a rich bright-red color when the animal is fully grown, and is firm and elastic. Examine it under a microscope, and you find it made up of even parallel fibres, each fibre seeming to be engraved over with delicate equidistant cross-markings, like a measuring-tape very minutely divided. The more the muscle has been used in a well-nourished frame, the more closely it conforms to the typical specimen of the physiologist:—

‘Use, use is life; and he most truly lives
Who uses best.’

“But suppose this muscular fibre has been unworked—suppose it is in the biceps of an Indian fakier, who has fastened his arm upright till it has become motionless, or in the gluteus of a soldier’s amputated leg, or the calf of a Chinese belle, or in a paralyzed limb—then the flesh is quite different in aspect; it is flabby and inelastic, of a pale-yellowish hue, and makes greasy streaks on the knife that cuts it. Sometimes even all traces of fibres have disappeared, and it is converted into an unhealthy fat. Sometimes you may trace fibres under the microscope, but their outline is bulging and irregular, the cross-markings are wanted, and you see instead dark, refracting globules of oily matter in them. In short, the muscle is degenerating into fat, retaining in a great measure its shape, but losing its substance. Such is, by God’s law, the penalty of not using His gifts for four or five months.

“Now go back to our first sepulchral illustrations. M. Devergie found that in a period of between four and five months the flesh of a corpse is converted into a substance technically termed ‘adipocire:’ an oleaginous substance between fat and wax—an artificial fat the result of chemical decomposition. What is this but precisely that which happens to the disused muscles in the cases quoted? At the Morgue, a continuous stream of water washed away the fetid gases from the subject of M. De-

vergie's observations, and in the living body destructive metamorphosis and excretion remove the more directly noxious particles; in both there remains the same oleaginous residuum.

"The instance chosen of diseased structure was purposely an extreme one; but even there, a very high degree of partial death was seen not to be inconsistent with life. A less degree is not inconsistent even with active usefulness. Look at many a man whom his physician knows to have a weak or slightly-dilated heart; he goes on with his profession, mixes in society, enjoys his quiet pleasures, and may even insure his life by paying an extra premium. Yet if an accident at any time should cut him off suddenly, the muscular tissue of the heart will be found pale and soft, while under the microscope the fibres are seen deficient in clear outline and in cross-markings, and exhibit here and there minute specks of that fatty degeneration which was so conspicuous to the naked eye in M. Devergie's subjects and in the completely palsied limb. The more dilated and the more weak the heart, the more widespread is this degeneration. Yet enough of active structure is left to carry on the work of the heart, and perhaps to prolong life to its allotted threescore years and ten.

"A close copy of the pathological process may be made by soaking a piece of muscle, say from a healthy sheep's heart, in a running stream, in weak spirits and water, or in nitric acid and water, for a few weeks, when sections made from time to time will exhibit the several stages of fatty degeneration, from the minute specks in the scarcely-altered muscle up to complete conversion into adipocire.*

"Remark in these cases of fatty degeneration or decay that the substance which replaces the highly-organized animal matter is not utterly inorganic. It is less organized and less organizable, but still capable of being called alive. Of our living bodies fat is a part and a necessary part; but still it is not capable of performing the highly vital duties of muscular tissue, of being as thoroughly alive. Degenerated products, therefore, so long as they form part of the body, may still be said to be alive, but *less* alive than the normal tissues they replace; and degenerate growth may be justly described as 'diminished life,'—or in the words I lately used, 'partial death.' Degeneration, in short, is a more or less relapse into a lower and lower form of organic life, and exhibits itself therefore in a variety of grades and amounts. Occurring in various parts, it occasions three-quarters of the chronic illness which give work to the physician.

"Let it be well understood that these half-living tissues are by no means necessarily lessened in size. A battered and renovated vessel is oftener much bulkier than a strong new one; and in the same way these undernourished parts are often enlarged, and so have been wrongly supposed to be overnourished. They often attain a most cumbersome weight and bigness without really containing tissue enough to do their work. They become, in truth, a foreign substance. Sometimes they acquire what seems like a parasitic life, and grow as if independent of the body which they inhabit. Then you justly look upon them with a peculiarly unfavorable eye, and call them by the epithet 'malignant.' Cancer is the best-known example to quote; and you who have watched its deadly

* Figured in "Medico-Chirurgical Transactions," vol. xxxiii., plate v., in illustration of a paper by Dr. Quain.

quickness of growth are perhaps wondering that it should be put forth as an instance of lessened vitality. But watch further with the mind and not with the eye only; you will see that its tissue never gains the higher characteristics of life; it never puts on the *form* of the part it is planted in, nor performs its duties. Moreover, its half-life, so easily acquired and so easily multiplied, is also easily lost. Its very tendency to die and to ulcerate is one of the chief dangers in which it puts your patient.

"But we are now driven to seek our illustrations among these dreadful sorrows of our kind, when we can find them in less painful scenes. Every one connects cancer and degeneration with death; but perhaps it is not quite such a familiar idea to see partial death in a cold in the head or relaxed throat. However much you may smile at the notion, it is a true one; and I should advise your taking the next chance which a catarrh gives you of seeing the truth and its bearings. It is almost worth while to catch one on purpose, so valuable is the lesson. And perchance your smile may become a grave and thoughtful one, when you reflect on the mysteries of life; when you think that the slight inconvenience you are bearing is of the same nature as that which divorces soul and body, a distant and indistinct foretaste of that dread cup which we must all one day drain.*

"Look at your catarrhal throat in a mirror—what do you see? The surface red, puffy, and with the component parts, such as the uvula, enlarged. There is also poured out a quantity of slimy material, which you well know by the name of mucus. At first you may be disposed to cry, 'Surely here is an active business going on; everything seems much more lively than usual; life is increased, not diminished.' Not so fast—examine in a microscope a little of this mucus, and you will find it made up of minute balls of transparent jelly with a granular aspect, technically called 'exudation globules,' 'mucus globules,' and 'pus globules,' floating quite free, and rolling over and over without any tendency to adhere together. Are these bodies a new creation, something which an inflamed membrane can produce, while a healthy one lacks the power? are they evidences of an additional life-force? By no means; for they have been identified with those elementary forms of nascent life by which all organic matters grow; they are young cells, or rather nuclei.† They are the form assumed by all liquid living material which under the influence of life is being transformed into a solid; they are an infant tissue strangled in its birth. Instead of uniting into a continuous web to clothe with epithelium the surface of the membrane, they float off helpless from deficient vitality. The business of mucous membranes is to be covered with epithelium, not to throw off mucus; and when they are doing the latter, they are so far forth in a state of diminished life.

"But you may ask, what is that redness and that throbbing of the inflamed part? do not they show an increased circulation of the vital fluid, and therefore increased life? Quite the contrary, for the membrane is

* And perchance also this may be an useful meditation, not only for medical men, but also (as is remarked in an article on "The Renewal of Life" in the "Medico-Chirurgical Review" for July, 1863) for amateur tamperers with life, who in their zeal without knowledge are so fond of remedying minor bodily ills.

† The identification of young epithelium and pus-cells, was some years ago amusingly made out by M. Lebert, who, in plate iii., figs. 3 and 6, of the atlas to his "Physiologie Pathologique," places them in opposition, with the intent of pointing out their differences, but with the result of showing their identity.

red because its blood-vessels are relaxed and dilated from loss of vital elasticity; the blood sticks in them as water in a bulged pipe; and the arteries, pressed upon from behind by the heart, throb because the obstruction impedes their action.

“But the pain,—does not that show that the vital power of sensibility is increased? I cannot, in general, feel that I have got a throat; and now I am reminded most disagreeably of the fact.’ No; pain does not indicate an increase of proper sensibility; in this case it is associated with a very marked decrease. During your catarrh the lining membrane of the fauces loses its delicate appreciation of flavors—everything is equally nasty, unless there is a pungency in it too powerful to be pleasant to the healthy taste. And it is wanting also in common sensibility; for it does not distinguish the shape or size of morsels swallowed, all of which feel equally large and awkward.

“Or you may get a whitlow on your finger, or a boil, and study how the nail is stayed in its growth, and the skin is killed; while the materials intended to renew them are checked in their development, and go to be deposited as pus, a concentrated form of half-vitalized fluid, very similar in every respect to mucus.* And, like your catarrhal throat, your inflamed finger-tip is wanting in sensibility: try it, and you will find for any delicate work, such as feeling the fine lines of a copper-plate, or the flaws in a polished surface, it fails in its duty. Pain, in short, is the brother of death; a painful part is never performing its whole vital functions—it is partially defunct.

“The same partial death, which has been hitherto described as constituting the various diseased states of the solid structures of the body, may also attack the fluids; and in them, as in the solids, it may show itself either as a destructive relapse into a less organic life, or as an arrest of development. The poison of fever, for example, destroys and renders useless as nutriment some constituents of the blood; the insufficient blood is circulated to all parts of the body, causing, not local pain, but general *malaise* by its deficient vitality. The half-poisoned tissues allow the poisoned material to ooze through them, causing diarrhœas, exhalations of blood from mucous surfaces, purple blotches on the skin, and a general staining of the whole body of a dusky hue. If the quantity of blood poisoned is moderate, it can be easily spared; it is carried off gradually by excretions, and its place is filled up in time by new blood. But if the rare case happens of so much being poisoned at once that too little remains to carry on the business of the body, then death occurs by sudden shock; or if, through ignorance, carelessness, or false theory, there is an insufficient supply of material to take the place of the killed blood, the vitality wanes away more slowly. And as its loss occurs more slowly, some one part more than another is usually affected; there is congestion and inflammation—that is, local death—of the digestive viscera, or of the lungs, or of the brain, and the patient’s disease is allotted by name to that last cause. And thus in fever, the blood relapses into a less organic form through its vitality being destroyed by a morbid poison.

“Let us next look for an instance of imperfect life in the blood occasioned by arrest of development. You are all practically familiar with

* On the pus formation in connective tissue, see Virchow’s “Cellular Pathology,” fig. 137, and text adjoining, and the Lumleian lectures which follow in this present volume.

the condition, so common among hospital out-patients, which you have already learnt to call *anæmia*. The word means literally 'bloodlessness,' but in reality relates rather to deficient quality than deficient quantity. The circulating fluid cannot but fill the hollow vessels which hold it, but it is wanting in the most highly organized, the most truly living of its constituents. It is pale, from the diminished numbers of those floating red globules which give it florid hue. This capital of red globules is by far the most important portion of the blood; so much so, that it may be taken as a direct measure of corporeal and mental vigor; a man has a larger proportion than a woman, a strong man than a weak man, an adult more than a youth or an elder, a patient after recovery more than during his sickness of whatever kind, a horse in high condition more than when brought up from grass. Yet in spite of this importance, we find to our surprise that this floating capital may be largely encroached upon without a bankruptcy. For example, Dr. Andral has analyzed the blood of a patient with *anæmia*, where the blood-globules amounted to less than 39 parts in 1000, whereas their natural proportion should be at least 120 parts in 1000. More than two-thirds of this constituent were missing! And yet the patient was living and moving, and very likely quite recovered in the end if rational treatment was adopted. Now, in pure *anæmia* there is not found any degenerated devitalized substance; the missing globules have not relapsed into a lower life, so that their ruins or debris should constitute a foreign morbid matter; they have been used up in the regular way, and have supplied materials for the tissues, as they are moulted off from day to day; while at the same time there has been a want of renewal, an arrest of that continuous development of blood, which is necessary to complete life.

"Pure *anæmia* has been spoken of; but, as might have been expected, this defective supply of the materials of growth much weakens the vitality of many of the manufacturing and excreting viscera: for their machinery needs continual repair, as much as any part of the voluntary apparatus. Hence, in cases of *anæmia* we often find that the liver is not so lively as it should be, and some of the color it ought to get rid of stays in the circulation, or exudes and chronically stains the skin of a bilious hue. Or perhaps the kidneys do only half work, and the urea which they ought to drain off is retained, causing very serious derangements of health. Thus there is a mixed pathology in these cases, a combination of arrested life with a relapse into a lower life; the life of the specially affected organ is diminished, and it leaves behind in the system substances of inferior vitality which its proper business is to excrete or separate.

"Or again, *anæmia* may so lower the creative power of the blood, that instead of the body being built of elastic and highly vitalized fibrin, it has to put up with a cheesy, brittle substance called tubercle. This is just the sort of fraud a rascally contractor commits, when he lays your floors on half-seasoned timbers. Your house is destroyed by dry-rot; and the lungs in which tubercle has been substituted for healthy connective tissue gradually soften and break up. The most effectual remedy in both instances is to look after the builders, to secure the honesty of the one and the vitality of the other as far as possible.

"When the various accidental circumstances of our daily habits dispose various parts of the body to even the few elementary forms of disease which I have mentioned here, a great variety of abnormal phenomena may be produced. Our body is a harp of so many strings, that all sorts

of discords may arise out of its combinations.* These discords have received much attention from minds with a taste for order; they have been classified into groups; and if, unfortunately, the orderly mind was afflicted with a theory, sadly have facts sometimes suffered by the Procrustean bed of a Nosology, into which they have been forced. On the whole the nosologists (*Nosολογοι*—people who talk about diseases) have been convenient, for their nomenclature often helps us to describe in one word what otherwise would want a parenthesis. But they have been a convenient evil, and their labors have had this bad result; they have attributed a positive existence to that which in reality is a negation. ‘*A Disease*,’ under their manipulation, instead of being a mode in which life is deficient, becomes an actual motive power; the giving it a generic and specific name links it in our minds with the subjects of a naturalist’s studies, and we get to clothe it in individual characteristics, and to assign to it individual actions. The consequences in science have been most fatal to true progress. It has had upon the art of medicine just the effect that would be wrought upon Optics by regarding a shadow as a material object instead of an absence of light, upon physics in general by accounting cold instead of heat as the active agent. The main hope for bringing Therapeutics up to the level of modern science lies in discarding at once and forever this traditional notion.

“I am glad to say less practical harm than might have been feared has been done by these false notions. In the first place, man’s body is tougher than usually thought, and will stand a great deal of wrong treatment; and, secondly, experience has somewhat checked the bold hand of a relentless adhesion to theory. Still, it can hardly be doubted that the increased chance of cure under professional treatment has not been so much as might have been expected from the advance of general knowledge.

“Of late medical art, as far as practice is concerned, has been turning over a new leaf; nosologists are of less repute, and at last, under the influence of common sense, attention seems directed to the maintenance of life *in* the body more than to the expulsion of death *out* of it. Such is the true preaching to the sober mind of the new modes of treatment which, without falling in with the dogmas of any particular ‘*pathy*,’ have yet been silently adopted by the rational adherents of each within the last few years. I may instance the care bestowed upon the selection of alimentary substances; the use of water, of oxygen, of iron, of animal oils, of chlorine, of soda in doses more like a food than a drug, of lactic and other organic acids, of salts of phosphorus and lime, of sulphur, ammonia, bile, pepsin, and several other agents established by common consent without being suggested by any previous theory of therapeutics, or traditional rules of the medical art. These are constituents of the animal frame, and are administered and trusted to as filling up an obvious void.

“If experience has taught us to reform our practice, should it not teach us to reform our theory too? that so the partial advantages which have been gained might become universal, and our words and acts might cease to be inharmonious.

“I began this lecture by likening the animal body to a building constructed of perishable materials, which need continuous renewal to maintain the usefulness of the structure. To keep up the simile, the perma-

* “Strange that a harp of thousand strings
Should keep in tune so long.”—WATTS.

nent architect is the indwelling life, and he best performs his duty, not by fits and starts of work, but by ever-watchful industry. He should be every moment removing decaying materials from the walls and working machinery to be carted away at convenient periods, and he should be every moment supplying their place by fresh. Thus there are two departments carried on simultaneously—the ‘destructive’ and ‘constructive;’ and upon their harmony and completeness depend the perfection of life which we call health. Both are necessary; and the deficiency of either or both, or the preponderance of one over the other in various parts, or their deficiency in one part while other parts remain active, constitutes a deficiency of life—a disease.

“This deficiency the physician is called upon to remedy; and it is of the utmost importance to his usefulness that he should recognize that it is a deficiency, and act upon the recognition. He must look at his pharmacopœia with this thought constantly present before him, with an eye to the ultimate benefit of the patient, to a goal beyond that of the immediate effects. He should make his chief thought how each of the reagents employed will finally touch life; whether they are calculated to add to or diminish the vital functions, to add to or diminish the vitalized substance of which his patient is made—whether by temporarily diminishing the functions or substance he may not remove an impediment to their balanced actions, so as to lead to a final increase—or whether this artificial diminution of functions or substance may not become permanent, and inflict permanent injury on his patient. This final goal of life renewal must be consciously or unconsciously in the heart of the physician, or in the heart of his guides; otherwise I am sure he contributes more to the ill health than to the good health of mankind.”

Music in Dentistry.—Notwithstanding the well-known fact that music exerts a potent influence over both mind and body, its hygienic and therapeutic value is not yet sufficiently appreciated to induce its systematic application to the prevention and treatment of disease. When, however, its vital relations become fully understood it will form one of the standard agencies for the removal of the graver as well as the lighter ills of life, and the promotion of health and happiness. Its medical applications are, indeed, so very extensive that it is surprising it is not more freely resorted to for remedial purposes, both in private and public practice, in families and in hospitals, in special as well as in general medicine, and particularly in dentistry, wherein it promises to prove very useful, not only to divert the mind but also to mitigate physical suffering, and directly relieve the dreadful nervous tension during tedious and painful dental operations. In this connection it is apparently of so much practical importance as to induce us to reprint from the *Atlantic Monthly* the following admirable remarks on “music as a physical and moral agent,” by the eminent pianist, Gottschalk:—

“Music may be objective and subjective in turn, according to the disposition in which we find ourselves at the moment of hearing it. It is objective when, affected only by the purely physical sensation of sound, we listen to it passively, and it suggests to us impressions. A march, a waltz, a flute imitating a nightingale, the chromatic scale imitating the murmuring of the wind in the ‘Pastoral Symphony’ may be taken as examples.

“It is subjective when, under the empire of a latent impression, we dis-

cover in its general character an accordance with our own psychological state, and we assimilate it to ourselves; it is then like a mirror in which we see reflected the movements which agitate us with a fidelity all the more exact from the fact that, without being conscious of it, we ourselves are the painters of the picture which unrolls itself before our imagination. Let me explain. Play a melancholy air to a conscript thinking of his distant home; to a mother mourning the loss of a child; to a vanquished warrior;—and be assured they will all appropriate to themselves the plaintive harmonies, and fancy they detect in them the accents of their own grief.

“The fact of music is still a mystery. We know that it is composed of three principles,—air, vibration, and rhythmic symmetry. Strike an object in an exhausted receiver, and it produces no sound, because no air is there; touch a ringing glass, and the sound stops, because there is no vibration; take away the rhythm of the simplest air by changing the duration of the notes that compose it, and you render it obscure and unrecognizable, because you have destroyed its symmetry. But why, then, do not several hammers striking in cadence produce music? They certainly comply with the three conditions of air, vibration, and rhythm. Why is the accord of a third so pleasing to the ear? Why is the minor mode so suggestive of sadness? There is the mystery,—there is the unexplained phenomenon.

“We restrict ourselves to saying that music, which, like speech, is perceived through the medium of the ear, does not, like speech, call upon the brain for an explanation of the sensation produced by the vibration on the nerves; it addresses itself to a mysterious agent within us, which is superior to intelligence, since it is independent of it, and makes us feel that which we can neither conceive nor explain.

“Let us examine the various attributes of the musical phenomenon.

“1. *Music as a Physical Agent.*—It communicates to the body shocks which agitate the members to their base. In churches, the flame of the candle oscillates to the quake of the organ. A powerful orchestra near a sheet of water ruffles its surface. A learned traveler speaks of an iron ring which swings to and fro to the sound of the Tivoli Falls. In Switzerland I excited at will, in a poor child afflicted with a frightful nervous malady, hysterical and cataleptic crises, by playing on the minor key of E flat. The celebrated Dr. Bertier asserts that the sound of a drum gives him the colic. Certain medical men state that the sound of the trumpet quickens the pulse and induces slight perspiration. The sound of the bassoon is cold; the notes of a French horn at a distance, and of the harp, are voluptuous. The flute played softly in the middle register calms the nerves. The low notes of the piano frighten children. I once had a dog who would generally sleep on hearing music, but the moment I played in the minor key he would bark piteously. The dog of a celebrated singer whom I knew would mourn bitterly, and give signs of violent suffering, the instant his mistress chanted a chromatic gamut. A certain chord produces on my own sense of hearing the same effect as the heliotrope on my sense of smell, and the pineapple on my sense of taste. Rachel's voice delighted the ear by its ring before one had time to seize what was said, or appreciate the purity of her diction.

“We may affirm, then, that musical sound, rhythmical or not, agitates the whole physical economy,—quickens the pulse, incites perspiration, and produces a pleasant momentary irritation of the nervous system.

"2. *Music as a Moral Agent.*—Through the medium of the nervous system, the direct interpreter of emotion, it calls into play the higher faculties; its language is that of sentiment. Furthermore, the motives which have presided over particular musical combinations establish links between the composer and the listener. We sigh with Bellini in the finale of *La Somnambula*; we shudder with Weber in the sublime phantasmagoria of *Der Freischütz*; the mystic inspirations of Palestrina, the masses of Mozart transport us to the celestial regions, toward which they rise like a melodious incense. Music awakens in us reminiscences, souvenirs, associations. When we have wept over a song, it ever after seems to us bathed in tears. The old man, chilled by years, may be insensible to the pathetic accents of Rossini, of Mozart; but repeat to him the simple songs of his youth, the present vanishes, and the illusions of the past come back again. I once knew an old Spanish general who detested music. One day I began to play to him my 'Siege of Saragossa,' in which is introduced the 'Marcha Real,' (Spanish national air,) and he wept like a child. This air recalled to him the immortal defense of the heroic city, behind the falling walls of which he had fought against the French, and sounded to him, he said, like the voice of all the holy affections expressed by the word *home*. The mercenary Swiss troops, when in France and Naples, could not hear the 'Ranz Des Vaches' without being overcome by it. When from mountain to mountain the signal of revolt summoned to the cause the three insurgent Cantons, the desertions caused by this air became so frequent that the Government prohibited it. The reader will remember the comic effect produced upon the French troops in the Crimea, by the Highlanders marching to battle to the sound of the bagpipe, whose harsh piercing notes inspired these brave mountaineers with valor, by recalling to them their country and its heroic legends. Napoleon III. finds himself compelled to allow the Arab troops incorporated into his army their barbarous tam-tam music, lest they revolt. The measured beat of the drum sustains the soldier in long marches which otherwise would be insupportable. The Marseillaise contributed as much toward the republican victories of 1793, when France was invaded, as the genius of General Dumouriez.

"3. *Music as a Complex Agent.*—It acts at once on life, on the instinct, the forces, the organism. It has a psychological action. The negroes charm serpents by whistling to them; it is said that fawns are captivated by a melodious voice; the bear is aroused with the fife; canaries and sparrows enjoy the flageolet; in the Antilles, lizards are enticed from their retreats by the whistle; spiders have an affection for fiddlers; in Switzerland the herdsmen attach to the necks of their handsomest cows a large bell, of which they are so proud that, while they are allowed to wear it, they march at the head of the herd; in Andalusia the mules lose their spirit and power of endurance if deprived of the numerous bells with which it is customary to deck these intelligent animals; in the mountains of Scotland and Switzerland the herds pasture best to the sound of the bagpipe; and in the Oberland, cattle strayed from the herd are recalled by the notes of a trumpet.

"In conclusion: Music being a *physical agent*,—that is to say, acting on the individual without the aid of his intelligence; a *moral agent*,—that is to say, reviving his memory, exciting his imagination, developing his sentiment; and a *complex agent*,—that is to say, having a physiological action on the instinct, the organism, the forces of man,—I deduce from

this that it is one of the most powerful means for ennobling the mind, elevating the morals, and, above all, refining the manners. This truth is now so well recognized in Europe, that we see choral societies—Orpheon and others—multiplying as by enchantment under the powerful impulse given them by the state. I speak not simply of Germany, which is a singing nation, whose laborious, peaceful, intelligent people have in all time associated choral music as well with their labors as with their pleasures; but I may cite particularly France, which to-day counts more than eight hundred Orpheon societies, composed of workingmen. How many of these, who formerly dissipated their leisure time at drinking-houses, now find an ennobling recreation in these associations, where the spirit of union and fraternity is engendered and developed! And if we could get at the statistics of crime, who can doubt that they would show it had diminished in proportion to the increase of these societies! In fact, men are better, the heart is in some sort purified when impregnated with the noble harmonies of a fine chorus; and it is difficult not to treat as a brother one whose voice has mingled with your own, and whose heart has been united to yours in a community of pure and joyful emotions. If Orpheon societies ever become established in America, be assured that bar-rooms, the plague of the country, will cease, with revolvers and bowie-knives, to be popular institutions.”

Anæsthesia, Insanity, and Dentistry.—The following interesting observations were elicited during a discussion on the use of anæsthetics in insanity, at a late meeting of the Association of Medical Superintendents of American Institutions for the Insane, after the reading of a paper on the subject by Dr. W. S. CHIPLEY, in which he observes (*Am. Journ. of Insanity*): “It has been proposed to combine chloroform and sulphuric ether in the proportions of one of the former to two of the latter, and the compound was asserted to be almost as pleasant and effective as chloroform and as safe as ether alone. Dr. Crockett, of Virginia, however, reports a fatal case from the inhalation of one drachm from a sponge of a mixture of chloroform one part, of washed sulphuric ether four parts.

“Other objections are urged against the use of the vapor of chloroform. Cases of permanent and serious impairment of the mind from a single exhibition of this article are reported. Six cases of insanity, which had continued from one to six years at the time of the report, are recorded in the *New York Medical Journal*.

“Dr. Bell mentioned a case, (Association, 1853,) of insanity of a lady, resulting from inhalation of chloroform administered by a dentist. After remaining under Dr. B.’s care one year, she committed suicide.

“At the same session, Dr. Kirkbride stated that he ‘had two cases under his care whose insanity was induced by etherization and chloroform.’ If one of these was caused by ether it stands alone on record.

“We cannot consent to dispense with anæsthetics. They are said to have been resorted to in China near the beginning of the Christian era, and they have been and will ever continue to be, a coveted boon to suffering humanity. * * * * *

“Dr. Kirkbride had never used anæsthetics, because he regarded them dangerous, and thought that but little benefit was to be derived from their application. That was also the experience of half a dozen of his friends. He had known of some cases in which the use of sulphuric ether by dentists had produced insanity.

"Dr. Walker said he could cite cases of persons who had used sulphuric ether for the purpose of having eight, ten, or twenty teeth extracted; and in six or eight such cases he had been assured by the friends of the parties that this had been the cause of their insanity.

"Dr. DeWolf had a case of a person who had become insane from having six teeth extracted.

"Dr. Tyler knew of some cases of the same kind, although this would seldom occur when ether was not used.

"Dr. Walker knew a lady who came to him to have her teeth extracted. He refused. He consented to take out two, and did so. Shortly afterward she went to the dentist and had all her teeth taken out. She returned, saying, 'I have had one job made of it.' She began to sink in health and spirits, and would undoubtedly have become insane but for a change of scene.

"Dr. Tyler mentioned the case of a woman who had a mouthful of decayed teeth, and she was rescued from insanity by having them pulled. Also, the case of a young man in a state of mania, who in a lucid interval had his teeth pulled and in a week was well. Still another case, of a woman who had decayed teeth; ether was administered to her, and she had thirteen teeth drawn. She was very much afraid, but got better.

"Dr. Hills stated a case of acute mania, which came under his observation in the Western Ohio Asylum, in which the pulling of teeth most decidedly relieved the patient. He knew of a number of cases within the last four years, in which the pulling of decayed teeth had resulted favorably. He knew of from one to two dozen cases of females being afflicted with acute insanity caused by decayed teeth."

"Anæsthesia by Nitrous Oxyd.—There seems to be a disposition to return to the use of the original anæsthetic nitrous oxyd.

"It was lately employed by Dr. Carnochan, of New York, in the amputation of a cancerous breast. The patient was in delicate health, and Dr. C. preferred the use of nitrous oxyd to any of the other anæsthetics, in her case.

"Dr. Colton administered the gas, and by alternating it with atmospheric air, the lady was kept in a gentle sleep, and entirely insensible to pain. The time occupied by the operation was sixteen minutes, and forty gallons of gas were used. Not a muscle moved during the anæsthetic sleep—the breathing appeared easy and natural—and the pulse remained full and strong. There was no nausea or sickness; and on waking the patient appeared as fresh as when waking from a natural sleep. Dr. Colton stated that he believed he could have kept the lady asleep two hours as easily as sixteen minutes. Dr. Carnochan expressed himself highly pleased with the operation of the gas, as also did Dr. Marey, who was present."—(*Med. and Surg. Reporter.*)

Chemico-Organic Circulation.—"DR. BENICE JONES, in a lecture recently delivered at the Royal Institution, says there are good grounds for believing that there exists within us, in addition to the mechanical or animal circulation of the blood, another, and a greater and more strictly chemical circulation, closely resembling, if not identical with, that which obtains in the lower divisions of animals and in vegetables. A circulation in which substances continually pass from the outside of the body into the blood, and through the blood into the textures, and from the

textures either into the ducts, by which they again pass into the blood, or are thrown out of the body, or into the absorbents, by which they are again taken back into the blood, again to pass from it into the textures.”
—(*Bost. Med. and Surg. Journ.*)

Tobacco Poisoning.—“In a recent number of the *Annales d'Oculistique*, Dr. SICHEL has a paper upon amaurosis produced by tobacco-smoking. Few persons, he says, can continue to consume daily more than twenty grammes of tobacco without their vision or memory becoming impaired. The fumes of tobacco appear to, act on the brain and on the origin of the optic nerves, thus producing passive chronic congestion, not very intense, but persistent and very obstinate. There are many smokers who may resist these effects for a long time, and the same can be said of other narcotics; the pernicious consequences, however, though slow in manifesting themselves, are none the less certain.”—(*Ibid.*)

Laryngoscopy.—In reply to a communication on this subject, DR. THOS. BUZZARD thus writes to *The Lancet*: “If Mr. Swete, who recommends the application of glycerin to the faucial mirror in laryngoscopy, will turn to *The Lancet* of June 25th, 1864, he will find that I have preceded him in the suggestion. I do not, however, think with him that the use of this liquid ‘prevents the condensation of the breath.’ On the contrary, the fact that after the mirror has been retained in the mouth for some time the quantity of fluid upon it is considerably increased, proves that condensation of the watery vapor has taken place. The process acts, I believe, by substituting a smooth transparent layer of liquid, which does not impede reflection, for the highly refracting surface produced by scattered globules of water which are deposited upon a cold and dry mirror when exposed to a moist vapor of higher temperature.”

“The Wrong Tooth.”—Mr. Commissioner Kerr has had a novel case to decide in the Sheriffs’ Court. Mr. Wainwright, a surgeon-dentist, brought an action against Mr. Galpin to recover his fee for extracting a tooth. The defense was, that the plaintiff administered chloroform, and pulled out the wrong tooth, a perfectly sound one, leaving the real offender still in its place. The defendant swore that this was the fact, and Mr. Kerr told the plaintiff that it was clear he could not recover, and the defendant must be allowed his costs.”—(*Lancet.*)

“Simple Method of reducing some Metals.”—Glucinum and zirconium, the former being the metallic base of the emerald and the latter that of the zircon and the hyacinth, are metals of which chemists know very little. They have hitherto been obtained only from very rare and costly minerals, and by reduction from their haloid salts by means of potassium. A paper in the last number of *Cosmos* suggests, however, that these two metals, and also the still less known ones, yttrium, erbium, terbium, cerium, thorium, lanthanum, and didymium, probably exist much more abundantly than has hitherto been supposed, and states that they all admit of being isolated by an exceedingly simple electrolytic method, consisting merely, in each case, in immersing in a solution of a salt of the metal which it is desired to reduce a plate of zinc and a plate of platinum, duly connected together. The metal is then gradually precipitated upon the platinum plate.”—(*Sci. Amer.*)

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, OCTOBER, 1865.

No. 3.

ORIGINAL COMMUNICATIONS.

DISEASE.

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THE fact that a thorough comprehension of the *nature* and *causes* of disease is as indispensable to the dentist, in the practice of his specialty, as it is to the medical man, in the intelligent and faithful discharge of his more varied though not less exacting and responsible duties, is so self-evident, that it demands little argument to substantiate the position; for although with the former it rarely if ever happens that the issue of *life* or *death* to the entire organization depends directly upon his knowledge or skill, yet the struggle in which each should be engaged is the same—the *preservation of health*, and thereby the *prevention* or *mitigation of disease*—and the failure to accomplish these results, on the part of either, may eventuate in the establishment of incurable affections and ultimate dissolution.

When merely regarding the dental organs as isolated portions of the human economy, the various evolutions which they undergo in the progress of their development, growth, and nutrition, the changes of maturity, the exuviation or removal of the deciduous set, and the replacement of more numerous and durable successors, and the different-casualties to which these are liable—are each and all important and interesting subjects of inquiry; but when directing attention to their sympathies as organs of a curiously-complicated structure, in alliance with the brain, through nerves, which, in addition, are connected with the great sympathetic nervous system, and which brings them in close relation with the other organs concerned in nutrition, the varied influences they possess become an additional and more extended field of observation. It must be evident, therefore, to every medical and dental practitioner, that a correct knowledge of the anatomy and physiology of the teeth, and of

the intimate relations existing between them and the organism generally, is indispensable to a proper appreciation of the pathological conditions to which they are liable, and the sympathetic derangements frequently developed in other portions of the economy induced primarily by dental irritation. It may be truly said, that the first step toward the cure of disease is to discover what disease is, and where it is located. The search, however, to determine what organ or function is deranged must be most vague and indefinite without a knowledge of the structure, offices, and relations which the various parts bear to each other and the economy generally in health. The practice of medicine, surgery, and dentistry affords numerous examples illustrating the position that a sound and rational practice in either department must be based upon a correct knowledge of anatomy and physiology; hence it is that the latter science, which treats of the actions or functions peculiar to living organized beings during the continuance of health or normal life, claims attention therefore, not as a branch of mere speculative knowledge, but as a science of immediate and vast practical utility.

While reiterating truths which the writer has over and again enunciated, and endeavored to enforce by example and sound argument, as an instructor in those departments of science, to successive classes of students for a number of years, it is foreign to the purpose of this communication to enter upon a detailed consideration of the anatomy and physiology of the teeth or the organism generally. It may be said, however, that one prepared as above to enter upon the study of disease should first ascertain what is meant by the employment of that term; for a marked difference exists between the definition or *application* formerly given to it, and that which is accorded by the progressive minds of the present day. The explanations in the past, indeed, too often have been scholastic rather than intelligible, and tended to mystify rather than elucidate the subject; and all this arose from a non-recognition of the exact status of disease. Had this not been the case, *disease* certainly never would have been spoken of as a *positive* rather than a *negative* condition, or the *expulsion* of disease from the body ever have been advocated. One might with as much propriety speak of the expulsion of *cold* or of *death*. So sure as *heat* is *positive* and *cold* *negative*, *life* *positive* and *death* *negative*, so surely *health* is a *positive* and *disease* a *negative condition*. As a recent writer* has happily and truthfully said, "Of late medical art, as far as practice is concerned, has turned over a new leaf; nosologists are of less repute, and at last, under the influence of common sense, attention seems directed to the maintenance of life *in* the body more than to expulsion of death *out* of it."

Health, therefore, from the premises assumed above, may be regarded

* The Renewal of Life. By THOS. KING CHAMBERS, M.D.

properly as a *positive* and standard condition of the living body; but this no more signifies a fixed state of the organism than to speak of heat as a positive condition implies an unchangeable degree of temperature. From the earliest period of existence, until the cessation of life indeed, constant changes are taking place in the organism of man, and upon the maintenance of this action or of nutrition (including integration or construction, and disintegration or removal) health depends; and any derangement of this constitutes dis-order or dis-ease.

This may be so slight and transient as to escape attention, or it may assume such proportions that the symptomatic manifestations of the tissue or organ involved would induce the nosologist to classify it as such and such an affection. Hence Bichat, the eminent physiologist, who, notwithstanding the variety of manifestations, recognized the oneness of disease, defined it as "*perverted nutrition*," and although this has been stigmatized as an absurd and nonsensical explanation, there is more of truth and logic in it, than is apparent to those who oppose and ridicule it, for there cannot be disease without perverted nutrition, or perverted nutrition without disease. This leads very properly to the consideration of the process of *nutrition*, which will engage attention in a subsequent communication.

TREATMENT AND FILLING OF PULP CAVITY.

BY JOHN N. FARRAR, D.D.S.

(Continued from p. 664, vol. vi.)

Second Division.

ALVEOLAR ABSCESS.—We will now notice the second division of our subject. These cases present to the dentist the greatest difficulty of the three classes under our consideration.

Here we have the surrounding soft tissues more or less involved, degenerated and broken down as a consequence of inflammation, thus forming an alveolar abscess. It is not my intention here to enter into the minute details of the causes of alveolar abscesses; for to do so would extend this essay beyond the limited boundaries designed.

The subject of inflammation is one of the profoundest in the science of medicine, for an understanding of which I will refer inquirers to the many valuable and elaborate treatises upon it. Every dentist should have a fair knowledge of this exceedingly interesting subject, to enable him to manipulate in such cases with confidence and success.

The primary causes of alveolar abscess are somewhat numerous. The principal ones are: blows upon the teeth; caries; fracture; effects of mercury; habitual biting of thread; hot drinks; badly articulated artificial dentures, etc., causing determination and congestion of the dental

membrane, but more frequently of the pulp. In fact, I am disposed to believe there are very few cases of alveolar abscess that are not the direct consequence of a dead pulp.

Inflammation having supervened, the capillaries become clogged, which prevents the normal and required supply of blood to keep the adjacent cells in health. During inflammation an increased amount of plasma, or liquor sanguinis, is thrown out from the blood, which, coming in contact with healthy living cells, becomes organized into other living cells. But, in case the cells are not healthy, the plasma does not receive sufficient life-force from them to become organized, and consequently remains inactive in the tissues. After awhile some of the debilitated cells—either new exudation cells or the primary ones—become so far exhausted that they die.

These dead cells now convert the surrounding healthy though inert liquor sanguinis into unhealthy or degenerated plasma, called liquor puris. Thus we have a miniature abscess established, containing broken-down cells and plasma.

The plasma continues to exude into the little abscess, which goes to the formation of exudation corpuscles or living cells, by receiving life-force from some of the contiguous cells which are capable of imparting it. But not all of this plasma is organized, but becomes converted into liquor puris, because the debilitated living cells of the true tissue are not possessed of sufficient life to transform the remaining plasma into living cells.

This miniature abscess is constantly receiving new supplies, which cause pressure upon the surrounding tissues, breaking down the alveolus and unhealthy cells in the surrounding membrane or periosteum.

If the abscess begins in the pulp, the reparative process is very weak, and unable to stand the devastating influences, and it soon yields.

This process continues until the life of the pulp is destroyed either from the presence of the abscess within it or from acute inflammation extending into it, in case the abscess originates outside, which, I think, is rarely the case.

If the pulp becomes highly inflamed by any surrounding irritation, its tissue and vessels become filled with exudation corpuscles, and it being so feebly supplied with nutrient vessels, the mass of new cells, together with the primordial cells, which before existed when in health, now become unhealthy beyond the point of resolution; therefore in a short time some of them die or become aplastic, and soon all the pulp is changed into pus.

The pulp having become converted into pus, the periosteum continues to separate from the end of the root by the breaking down of the cells of the true tissue, which forms the attachment to the tooth near the foramen. Thus we have the limiting membrane to the abscess constantly increasing

in size, lined with exudation corpuscles, which are constantly breaking down and forming pus, because they do not possess sufficient life to combat the deleterious influences, and being in bad company are overcome and destroyed.

This continued organizing and breaking down of cells, and exudation of the healthy plasma, was once erroneously considered a secretion of pus from what was then called the *pyogenic* membrane, which means pus-secreting membrane. The alveolar process, which is easily absorbed, gives way by the combining forces of degeneration and pressure of the pus. Thus, the sac enlarges, until it finally breaks through the bony wall in which it has been confined, and coming in contact with the gum, generally at a point nearly opposite the apex of the root, the sac and gum soon give away and allow the exit of the pus, which, in a healthy constitution, is an opaque, creamy fluid, slightly green, and sometimes of a disagreeable odor. If the sac opens between the tooth and its periosteum the pus will work its way along the whole length of the tooth, and escape around the neck. When this is the case, the chance for successful treatment is quite limited. Sometimes no fistulous opening is formed, the pus escaping through the canal of the tooth. Again, we will occasionally meet cases where a fistula has opened on the inside of the mouth, or breaks through the floor and allows the escape of the pus into the antrum, causing what is termed diseased maxillary sinus, which, if allowed to continue too long, sometimes produces a condition of affairs not easily cured.

Sometimes the fistula will open on the external surface of the cheek or under the chin, which generally causes a very unsightly cicatrix, unless prevented by skillful treatment.

If the contents of the abscess escape externally, or are likely to, or open into the antrum, the offending tooth should be extracted at once, and further treatment resorted to, according to the nature of the case.

Great pain is generally experienced during the formation of an abscess, which increases until an opening is effected to allow the escape of the pent-up fluid. This, however, is not always the case, for sometimes the abscess progresses very slowly, and is comparatively painless. The escape of the pus may be facilitated either by the lancet or the application of a roasted fig or raisin to the gum over the point where it is most likely to open. Sometimes the tincture of capsicum applied to the gum is of great benefit. The presence of pus is always very deleterious to the surrounding tissues. Never poultice the face in these cases, for fear that an external fistula may be formed.

Treat systemically with common antiphlogistic remedies, and keep the secretions of the alimentary canal right. Sometimes there is considerable constitutional disturbance, such as chills and fever. These cases must be treated according to the circumstances. Opium or anodynes may be

used sometimes with the view of quieting the pain so as to enable the patient to sleep.

As soon as an opening is established the pain almost entirely subsides. After the pus is once discharged the disease generally assumes a chronic character, unless prevented by some kind of treatment. The sac refills and discharges, continuing sometimes for years. In a healthy state of the system the formation of the pus will often be very slow, and the discharge slight; but if the patient takes cold or becomes unwell, the sac refills and discharges soon and often.

In these cases, our treatment must be conducted with the view of arresting the formation of pus, and restoring the limiting membrane to health, causing it to form healthy granulations, to fill the cavity, and ultimately the ossification of that portion of the space previously occupied by the alveolar process. After the main portion of the pus has been discharged, pass into the abscess, by means of a hard rubber syringe with a gold nozzle, a small quantity of creosote, to cauterize the inside of the sac, care being taken to avoid getting any of this drug upon the mucous membrane of the mouth. If the abscess has no fistula, an artificial one may be made by means of a small drill passed through the gum opposite the apex of the tooth; then giving it a few rotations it drops into the abscess, causing generally little pain. This is, however, not necessary; but, if the patient will permit it, I think it will aid the operator very much. If the canal is of proper size, and circumstances will admit of it, as is generally the case with all of the small-fanged teeth, the creosote may be forced into the abscess through it, by means of a small piston made by twisting around the extremity of a nerve-broach a small tent of cotton the size of the canal; then, after saturating it with creosote, introduce it, and pump it into the abscess, until the drug makes its appearance at the external orifice of the fistula. Some dentists prefer a mixture of creosote and tincture of iodine in equal parts. It is a very excellent article. Here we get the absorbent properties of the iodine to assist us.

The abscess sac may sometimes be cauterized by passing into it a silver wire, first dipped into nitric acid, which, uniting with a small quantity of the silver, forms nitrate of silver. This method of Prof. Buckingham is a very excellent way of accomplishing the desired result in some difficult cases. After this cauterizing operation, take a small instrument, pass it into the abscess through the fistula or canal, rotate it with the view to breaking up the sac, until blood shows. This operation may be performed prior to the injection of the drugs.

If the operator has no syringe, and is not able to pump the agent into the abscess through the canal, owing to the exceeding minuteness or tortuosity of the nerve passage, take a few inches of floss silk thread, saturated in the agent, and by means of a small broach, curved or straight as

the case demands, work it into the abscess through the fistula, extracting it after the expiration of a few minutes. By this means we can obtain the desired result.

This treatment should be repeated every day or two for awhile, say a week. If the case is of long standing, the abscess may not succumb for several days or weeks, but generally it may be cured in two or three weeks, sometimes sooner. Dr. Baxter says one cauterization with creosote to an abscess of short standing is sufficient in most cases.

It is not generally necessary to lacerate the sac more than two or three times. After a few days of the drug treatment, the frequency of the operation should not be persisted in oftener than once in three or five days, thus giving nature time to act, which shows itself first by the closing of the fistula so that the agent cannot escape through it. After each application fill the canal with floss silk thread saturated with creosote, and plug it in by a sandarac pellet. If the creosote be applied too often, nature will not get time to help herself. The abscess will not heal so long as the frequent treatment is continued.

The healing process is called adhesive inflammation. The old and half-alive exudation corpuscles or cells are either destroyed or stimulated to health by the drug. After the separation of the dead cells from the membrane, the new exuded liquor sanguinis or plasma becomes converted into healthy cells, and is organized by the extension of blood-vessels among them in the form of loops.

The periosteum slowly approaches its old situation, finally embracing the apex of the fang, but does not become united to it, because it has become necrosed, on account of its separation from the nourishing membrane. To restore life here is impossible.

Although this part of the tooth is dead, yet it does not necessarily follow that its presence must continue an existing cause of pus formation, as it undoubtedly has heretofore to a certain extent. By the introduction of creosote, the tubuli become filled with it, thus antisepticizing both the dead apex of the root and the small amount of pus remaining in these little cells or tubuli, and preventing further decomposition. Under these circumstances, the necrosed part becoming embraced by the periosteum is placed in a similar position to an encysted foreign body.

The tooth is now ready to fill, which is conducted precisely as in a case after destroying the pulp by arsenical paste, before alluded to. First deposit the antiseptic foramen pellet, and proceed as before.

The abscess cavity becomes filled with thickened membrane and surrounding soft tissues, which slowly harden into a kind of fibro-cartilaginous substance, gradually becoming ossified. The rapidity of the ossifying process varies according to the systemic condition of the patient. Under favorable circumstances, Dr. Atkinson says, it will become ossified in from two to eighteen months.

Third Division.

The third and last division of our subject is the simplest of the whole.

The pulp has died from some cause oftentimes unassignable, and not followed by any abscess, though perhaps attended with considerable periostitis, sometimes chronic in character. This must always be cured before filling the tooth. To accomplish this, use leeches, lancet, creosote, and astringent mouth-washes as before mentioned.

The pulp has either become absorbed in part or whole by the absorbent vessels and the tubuli of the dentine, or been discharged from a carious opening in the tooth. When taken up by the tubuli, the tooth becomes dark colored and unsightly. Various plans have been recommended to restore the tooth to its original shade; and, while they do it to a certain extent, the structure of the tooth becomes weakened, and after all is still discolored somewhat. Therefore, taking all things into consideration, the best mode of procedure, says Prof. Peirce, is to excavate the tooth as well as possible and fill with gold without attempting to bleach it.

After cleansing the canal thoroughly, pack it full of floss silk and creosote, and put over it the sandarac and cotton plug, to prevent the escape of any of the drug into the mouth. Let it remain in several hours or even days if desired. Sometimes, if everything looks favorable, the tooth may be filled directly, and not be followed by any untoward symptoms. Still, if the patient is not put to too much trouble, it is better to use the temporary filling of silk. By this the operator is enabled to avoid in nearly all cases the liability of being obliged to remove the permanent filling, which sometimes is necessary when a tooth is filled before the proper time. It also assists the operator to diagnosticate the condition of the periosteum, for sometimes an abscess in its incipient stage is present, and will make itself known by being pent up so as to prevent all escape of pus.

In all cases the canal should be swabbed out with creosote so as to fill the tubuli with it, and prevent any further decomposition in those parts. After having all of the preliminary requirements completed, then commence filling with the antiseptic pellet as before, packing upon this the gold until the canal is filled, and the original contour of the tooth is restored where the caries have shown their denuding results.

The enamel is somewhat more easily affected by the acid secretions of the mouth when there is no vitality in it; but if it is properly cleansed and filled, and the patients do their duty to the teeth with the brush, the secretions will not show their effect on these teeth more than on any others in the mouth.

TEACHING.

BY WM. H. ATKINSON, M.D.

Read before the Northern Ohio Dental Association, May 3, 1865.

THEY who engage in new enterprises are particularly anxious to have the *eclat* of what they esteem a respectable beginning. Prestige is not to be lightly esteemed, but the mere manner of *sowing* should in no case take precedence of sedulous care as to the kind and quality of the *seed* we desire to place in favorable position for germination.

The faithful horticulturist carefully and fully studies the habit of germination, growth, flowering and fruitage, as well as the soil in which his plants delight, and thus he is enabled to apportion them to the proper places as to richness or lightness of soil, exposure to sun and shade, etc., in accordancé with the intent for which they are cultivated.

Those whose habit is luxurious growth, require pinching in and restraining methods of training, while those of delicate and feeble growth demand the kindest nursing and timely protection from the vicissitudes of season and weather, that untimely chill or sudden heat exerts no baleful influence upon them, so sure to blight the hoped-for crop of fruit or flower. All this knowledge is necessary to enable him to fill but not overcrowd his ground with plants. In case he have not seed enough to sow all over the prepared face of the soil, he will be obliged to work the harder to keep down the weeds that spring up in the unoccupied portions, but each plant may then be farther from its fellow, allowing it more soil from which to draw its nourishment, and thus have opportunity to transcend in size and quality the standard of its kind, and so repay for the increased space it occupies. Slow growers, that are only in flower when the season ends, must be removed to the hot-house to fruit, or be cut to take secondary places to make up the ensemble of bouquets composed of rarer flowers.

Our purpose, like that of the horticulturist, is to bring out the highest culture of which our germs are capable and our soil can afford. In a word, our purpose is to make A No. 1 dentists (or at least contribute toward that high consummation) of those who enter our classes, holding that a work worth doing at all is fit to be wrought out in its highest possibilities. Those who grow so much to leaf and limb as to preclude flowering and fruitage the first year, we shall endeavor to induce to make terminal and winter buds, to enable them to hibernate until the vernal breezes and genial showers may awake them to the work of growing flower and fruit.

All those plants which persist in growing only leaf and limb, we shall transfer to the field whose work is "the healing of the nations," and those who refuse to come through, but persistently remain in a vigorous efflorescence, we must assign to their legitimate field of labor in general surgery.

But those who put forth well-formed limbs, covered with fully-developed leaves, through whose tufts protrude fragrant flowers that do not fail to give place to ripened fruit, we hail with open arms and throbbing hearts as the legitimate results of well-directed culture in dental science and art.

The highest ideal medical school would matriculate only those who pass the departments of botany, chemistry, pharmacy, anatomy, and physiology, to which they would add theory and practice of medicine.

The highest ideal of a school in general surgery would matriculate only graduates from the ideal medical school.

And the highest dental school would matriculate only graduates from the ideal school of general surgery, to which they would add principles of dental science and art, special anatomy and physiology, operative dentistry, artificial dentures and appliances, and a well-digested course of instructions in metallurgy.

But as none of these high ideals are as yet practical, we must content ourselves with our best endeavor to contribute toward their future adoption by those who can only take the elevated stand because of the preparation made by their humble but earnest predecessors.

The meeting of this body is an occasion that affords opportunity to present if it does not imperatively demand a somewhat extended survey of the function of teaching in general and in particular.

Standing, as we of this age do, midway between the (genesis) origin of all things and (apocalypse) the ultimate summation of philosophy in the fullness of complete revealment, it becomes us to so balance the authority of rigid conservatism, of finited "*reality*," and the limitless freedom and indefiniteness of "*ideal* extensity," as to hold ourselves above the one and within the range of the other, so that both may be made subservient to our attainment of knowledge, without which fruit of mental labor we have no basis upon which to demonstrate fact or philosophy.

Teaching properly signifies the communication of the products of the labor of mind to mind; hence the hiatus between teacher and learner should be made as little felt as possible, that repulsion may be small and attraction great, thus favoring the mutual interblending of mind with mind, informing the teacher of the exact need of his pupil, enabling him the better to make the discovery of the solution sought, through the unperceived medium of magnetic contact.

The rapidity of the movement through which it is necessary for the mind to pass to attain the tension requisite to the solution of the problem before it, depends upon the inherent structure and relationship of the organs whose function it is to produce that which we denominate mind; hence there can scarcely be two minds exactly alike in celerity and clearness of perception and definition. So our standard of quick or slow will be formed by our observations of the minds with which we have come in contact. And this very diversity of endowment and culture becomes one

of the greatest hinderances in the way of the regular and equal progress of a class of pupils who are to take the same course of study and demonstration ; the fast fret at the slow for the delays they cause them, and the slow fret at the fast for their fuming, unreasonable impatience, and satisfaction with jumped-at conclusions, confidently averring that anything so rapidly acquired must, in the nature of things, be as rapidly forgotten, and hence worthless. There is but one way to remedy this evil, and that is to allow each pupil to advance as fast as he may.

The duty of the teacher is not finished when he shall have gone through the prescribed routine of his curriculum, regardless of how well or illy it may have been apprehended by those to whom it was delivered, which is evinced by the haste to get through the irksome hour and slip from the desk with clandestine celerity, that the more pleasant association of the club-room, with "bon vivant" occupants who live on other men's earnings, may in some degree compensate him for the "*sacrifices* he makes for his pupils." Nay, he is not a teacher fit for his place who regards faithful performance of his every labor to advance his class as *a sacrifice*, in any other sense than that noble devotion of his best powers to the complete fulfillment of the mission his Heavenly Father has committed to his charge, in the execution of which he can alone count himself happy.

The true teacher heartily regrets that his hour is so soon fled, and mourns that the rigidity of the prescribed rules must take precedence of the outgushing desire to open up the whole treasure-house of mental stores that now, by the attrition of the effort to disseminate them, literally clamor for freedom of pronouncement, while the asking aspirations of the class hold teacher and pupil in the favoring mental tension by which to communicate and receive is making it not a task but a delight to both ! When none but "teachers" occupy "chairs," and none but "pupils" fill the "seats" of schools, we shall hear less of "the dryness of study," and the "sacrifices of teaching."

The greatest evil that has befallen the whole range of teaching, sacred or secular, has been that incubus "pecuniary compensation !" which, "while most have coveted," a few have nobly ignored with "Him of blessed memory" as their head and type, "going about doing good" to all "without respect of persons." And yet it has been the abuse rather than the inherent iniquity of the practice, that has laid it under the anathemas pronounced against it. And until that which constitutes the currency of a country becomes the symbol of a given amount of labor which it truly represents, we shall not be able to extricate ourselves from the inconveniences complained of in the past and present by other means than through our educational influences of all kinds and degree, making it so disreputable to get something for nothing, or that which amounts to the same thing, a loose promise to pay in a medium of a fluctuating character and value, that no one can have the hardihood to perpetuate the dishonorable swindle.

Whenever we propose to pay persons for what they know, without the requirement that they satisfactorily impart it to those who listen and pay, we shall ever be in the predicament of vicarage, forced to accept the cheapest ability that is within reach of the principal to employ, after the example of manufacturers who engage the lowest grade of skill in the employees who produce their wares, so as to enhance the profits of the establishment, accruing to the stockholders.

Such is the commercial, I had almost said gambling, spirit of this age, that it is the general practice among our "best members of society" to wink at if not openly advocate the practice, the exercise of which has entailed upon us the inferior wares and doubtful morals that lay at the base of the infamous structure of false education in science and morals. Such is the jealousy and rivalry between conservative and novel methods of teaching that neither can hold undisputed sway.

All rivalry has its origin in the folly of entertaining the possibility of any one being able to take the place of any other. In the nature of things, each individual or combination of persons can only produce that which inheres in the organic nature which constitutes it. In a word, the stream can rise no higher than its source; the germ can no more than evolve the type stamped upon it by the parent stock.

Ready speakers are enviously dubbed "verbose," by those who claim to understand, but confess they are unable to teach, what they say they so surely know.

A little observation will convince us that he who really knows will find means to prove his claim in one way or another, and vindicate the legitimacy of his mission. If he have no call to teach, he will soon learn that fact upon making the effort.

Whether we should give our preference to old or new teachers, will depend entirely upon which fulfills the demand made upon them to the best advantage and advancement of the pupil. That the first man must have been taught of God, is a proposition so plain as to command the concurrence of all; but in what manner the communications were made, is not so universally agreed upon. If we can but ascertain just how any mind comes into possession of knowledge, we shall have means by which to explain the manner of all acquisition of mental wealth. To comprehend this, we have to contemplate freedom and necessity of MIND.

If asked for a clear definition of what freedom of action is, we reply that any act itself not determined by some other act is free. The infinite mind is free because it includes all possibility of action.

Man is so far free as he partakes of the nature of the infinite uncaused acts of God. And he is bound in so far as he partakes of the serial positings of the Infinite in planetary bodies, which are, from the necessity of plus and minus expressions of force, confined within the law of *movement* producing them.

To illustrate: the human mind is free to contemplate infinity at pleasure so long as it remains negative or passive; but the instant it attempts to project itself into states of positive existence, it is forced to take the regular positings of numbers, if you please, in exact accordance with arithmetic modes of movement, or it cannot demonstrate to its own understanding the inherent powers of the aggregations, or separations of numbers. Hence, if we would solve any proposition, we must consent to travel within the rule ourselves, until the series of perceptions necessary to the focalization of mental attention be complete in the solution of each successive step in the process which becomes in the end the final solution or answer to the whole.

Our preference then should be given to that teacher, be he young or old, conservative or transcendental, who best is acquainted with the mental processes through which he has passed to acquire whatever attainment he may possess.

The fact of knowing is the mere function of mental existence.

The function of teaching is the fact of dissemination of germs of knowledge in mental soil not yet cultured in the production of these plants.

As all forms of individual being must be mature and in possession of a plus quantity of that which constitutes them before they can multiply themselves by propagation of their kind, so, too, must every mental labor be brought to maturity or fruitage before it can be successfully propagated upon other mental stocks, improving or deteriorating the quality of the new variety above or below the standard of the parentage from which it sprang.

Much has been done in the past by empirical gathering of fragmentary knowledge or portions of science, but if we desire each epoch to be wiser than the past, and to do something toward hastening the great consummation of all fact into the one grand philosophy of ultimated knowledge, it behooves us not to stick too closely to the confined and fractional philosophies of the past, whose formularies partake so much of the deciduous methods of their pronouncement as to be principally made up of the mere means of leverage to force us out of our primal ignorance into their confined leading-strings. Neither should we ignore the little wheat that the great mass does contain, under the misapprehension that it is all chaff; for the formularies, like the chaff of wheat, have served a useful purpose in protecting the precious seed from the devouring elements until it had matured, so as to germinate and bring forth abundantly in the richer and more refined and thoroughly prepared soil in which it is proposed to sow it broadcast with the improved skill of later cultivators.

Not fearing then to set free the young and robust mind to run at a tangent from the point of its departure, at the risk of bisecting and transcending the staid formularies of the vauntedly exact methods of the past, let us complacently contemplate the fanciful attempts of vigorous youth

to grasp at one magnificent effort the whole range of mental acquisition in the solution of the great problem of ideal and real existence, which spontaneous movement is itself both proof and prophecy of the ultimate accomplishment of the desire. A movement which is to cure the dissensions between past and present methods, by harmonizing fact and philosophy, must originate beyond the sphere of popular prejudice or scholastic bigotry, in that quiet circle of thinkers, observers, and scholars who prize truth, and seek her for her own sake with an ardor that knows no abatement, even in the midst of multifarious discouragements that obstruct their way. "The tactics and the drill of this warfare are not to be learned amid the smoke of battle, by the mere tyros and bigots who are in such hot haste to practice them, but must be brought thither by those who have been schooled into philosophic tastes and habits."

"When this class of teachers shall have been duly inaugurated in all the schools of all the departments of human learning, science will then have triumphed over error, and art over nature. Reason will then have unfolded the riddle of the universe, from its genesis to its apocalypse; and that cosmical idea toward which the Creator has been moving through mighty periods of creation, from the primordial planetary germ, by means of successive strata, floræ, faunæ, and human races and nations, will at length stand forth revealed in the fullness of its life and glory.

"At the height we have now reached in our contemplations, how wide the horizon! How grand the prospect! As from a lone eminence of faith, where the whole past and present and future of our race are spread out at one view, we look down upon that divine system of the world in which the end is known from the beginning.

"We see long ages roll onward ere it shall all be fulfilled, vast literatures and civilizations shed like forest leaves in its fulfilling, and unspeakable glories crowding thick and fast to its culmination, until, blinded by the vision, we almost wonder that mortal may gaze and live.

"But we will not doubt His fatherly goodness who, having shown unto His human children even the far-off stars in their destined courses and periods, will surely deign not less that they should scan the track of His earthly promises, and give them some Pisgah where they may lie down and die content, that other generations shall enter into that for which they have toiled."

To a corps of teachers thus endowed, and thus enthused with the importance and prospect of their holy mission, labor is rest, and the most arduous toil is joy, in view of the great results sure to follow the unselfish exercise of the work they have to do.

The function of teaching, like every other function, is self-compensating, by the increase of power and facility which it acquires in the tried and demonstrated fields of its labors, for the conquering of the untried and extended propositions which yet lie before it.

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION.

REPORTED BY DR. W. C. HORNE, OF NEW YORK.

(Concluded from page 96.)

THIRD DAY.—*Morning Session.*

THE Association was called to order by the President at half-past ten A.M. The minutes of the previous session were read and approved; after which the Association proceeded to a choice of the place for holding the next annual meeting.

Dr. Chesebrough proposed the City of Boston.

Dr. Stone named Louisville, Kentucky.

Dr. J. A. Perkins named Portsmouth, New Hampshire.

Dr. Shepard advocated the selection of Boston, claiming that in the election of last year, Boston stood next upon the list to Chicago, and there was a tacit understanding that Boston should be selected as the next place for holding the Association. It had been said that if the West obtained the Association, having the power it would keep it. He had too much confidence in the generosity of Western men to believe it. In the large cities they could enjoy the benefits of the newspaper reports as they had here, and he was free to say that the admirable manner in which their proceedings had been reported by the press excited universal commendation. The interests of the Association would be materially enhanced by going to Boston.

Dr. Stone followed in advocacy of Louisville, but if the Association went to Boston he would gladly go with it.

Dr. Morgan, of Nashville, while he favored Louisville, felt like Ruth of old; whither the Association went, he would go.

Dr. McQuillen advocated the claims of Boston last year because he then thought the "hub of the universe" needed attention in relation to dental association; within the past two months, however, he had visited that region and been present at the meeting of a number of dental societies, and he was happy to bear testimony to the fact that the profession in New England was aroused to the necessity and importance of associated effort, and nowhere more than in Boston. He therefore now advocated going to that city with a view of encouraging and extending this good work; he also considered that the many points of interest there presented—Prof. Agassiz's Museum, Harvard University, the Public Libraries, Bunker Hill Monument, etc.—were so many places where the members would reap valuable information and derive much pleasure.

Dr. J. W. Ellis thought it would be better to go to a cool city on the

sea, than to meet in one of the hot interior cities like Chicago. He was in favor of Boston.

Dr. Horne, speaking for the New York and Brooklyn Dental Societies, which had a membership of over a hundred, set forth the advantages to the Association and profession at large, of meeting in cities which had the advantages of first-rate newspapers to place their transactions before the whole country. He appealed to the courtesy and generosity of the Western members, who formed the great majority of the Association present, to make Boston the place of the next annual meeting.

On the first ballot the City of Boston was chosen as the place for the next session of the Association.

The Treasurer, Dr. I. J. Wetherbee, made a statement of the present condition of the finances of the Association, as follows:—

Expenditures already made, estimates for publication, incidental expenses, etc.....	\$480.93
Receipts.....	242.00
Leaving a deficit of.....	\$238.93

This amount (\$238.93) the Treasurer suggested should be raised by special assessment upon the members present.

Dr. J. W. Ellis moved that a special assessment of two dollars be levied upon each member. Carried.

Several inquiries being made in regard to the publication of Professor Brainard's lecture, the President stated that any number of copies could be procured at a small cost, by leaving orders with the Publishing Committee.

Dr. Morrison presented a plan of a cast-iron enameled spittoon; there is no patent on it; it will be made by Dr. S. S. White, at a cost of not more than fifty dollars. He offered it to the profession.

Dr. Peebles moved that a vote of thanks be tendered Dr. Morrison for his diagram of a dental spittoon, and his generous offer to permit its use without the purchase of patent rights. Which motion prevailed.

Dr. J. McManus offered the following resolution, which was adopted:—

Whereas, This Association regard it as their duty to guard the public against the use of the various articles so extensively advertised as beneficial to the teeth, but which we deem injurious,

Resolved, That a committee of five be appointed to prepare and present to this body, and the profession at large, such a formula for tooth powder as this Association judge proper for public use.

Dr. Kulp desired to withdraw the amendment to the Constitution of the Association proposed by him last year, for admitting to membership in the Association delegates from foreign societies.

Dr. Fitch, of New York, moved that he have permission to withdraw it.

Upon this subject considerable discussion ensued, Drs. Ellis, of Chicago,

and Atkinson, of New York, favoring the passage of the amendment, and Dr. McQuillen and others opposing it. Dr. Atkinson claimed that science was as broad as humanity, and should comprehend all nations. Some members were in favor of admitting foreign delegates to seats in the body of the Association, without a voice in its deliberations.

Dr. McQuillen had regarded the proposed modification with favor when presented last year. But owing to a correspondence with a professional friend in England on the subject, and subsequent reflection, he had concluded that it was best to let the matter rest as it was. He fully recognized that science was as broad as humanity, but he also remembered that this was the AMERICAN DENTAL ASSOCIATION, and he had reason to believe that the cultivation of science on the part of scientific men of separate nationalities had a stimulating influence, and accelerated rather than retarded scientific investigation.

The question being put, Shall Dr. Kulp be permitted to withdraw his amendment? it was lost.

The question was then put upon the amendment, which was "To annul in Art. 2 of the Constitution, the following clause: 'In every part of the United States;' also, in Art. 3, Section 2, the words, 'in the Union.'"

The amendment was lost by a large majority.

Dr. Peebles moved the passage of the amendments to the Constitution, notice of which had been given by Dr. Spalding at the last annual meeting.

The amendments were all adopted.

The report of the Committee on Dental Chemistry was called for; the Committee had no report.

The Chairman of the Committee on Dental Pathology and Surgery being absent, Dr. Atkinson presented a report, in the opening of which he proposed to examine somewhat in detail as well as by the broadest generalizations, the subject of function as the legitimate basis of physiology, without a comprehensive knowledge of which we can have no understanding of pathological science, the necessary foundation upon which to build the principles and practice of a beneficent surgery, general and special. He spoke of *function* as the *work* of body, therefore the body to which it belongs must first be defined; but so crude are all the apprehensions of biological processes that close definition, under classification of ideas, language, and beings, is next to an impossibility. And yet we see clearly enough that every body capable of function must have being, which opens the question of how bodies become, or are constituted, individualities. The first announcement of any proposition must assume the aspect of dogmatism, where it remains until proven a verity; then it at once takes its only other normal status among proved aphorisms, which thereby become, to all who are familiar therewith, simply a truism.

Each function, when understood, "becomes the key to every other func-

tion of every possible body." After our most extended and most minute survey of bodies in action, what has presented itself as the type of all functional activity as displayed in every body without a single exception? Answer, that which is usually called "breathing" is this example of unitary function.

This is plain to all who are willing to take the pains to observe the essential movements of cells, tissues, organs, and systems, mineral, vegetable, or animal throughout the entire range of these bodies, complex and simple. If their inspiration, (diastole,) digestion, and expiration, (systole,) be the generic acts constituting all of the function that is apparent to external observation, is it not conclusive that supply and waste, health and disease, are dependent upon the degree and manner of the performance of this triune rôle, the basis of function everywhere? Starting upon these premises, the doctor elaborated at some length the views which he entertained on this important subject.

Dr. Chesebrough followed with an essay on a different branch of the same subject. The title of the paper being "The Sympathy existing between the Human Teeth and Viscera, especially the Gravid Uterus."

He adverted to the sympathy existing between the different parts of the human system, and proceeded to speak in detail of the means of communication between those parts. He narrated investigations made by him in pursuance of the subject, dwelling particularly upon nerval affections of the teeth, and the important functions performed by the sympathetic nerve, and its intimate connection with the dental organs and their diseases, citing many cases which had come under his own personal observation, and demonstrating completely an intimate connection of the nerves of the teeth with the nerves of the stomach, the kidneys, and in the female sex with the organs of generation, and urging that when derangements of these organs exist, the teeth should be placed in perfect condition, and exposed nerves treated, during gestation, thereby striking at the fountain-head of the difficulty. In reply to the question, "Why should the uterus affect the teeth and conjoined parts more than other organs?" he replied: During the period of gestation, this organism is more sensitive than any other, on account of the great increase of the size of the organ and the consequent greater vascularity, with greater supply of blood. But he considered the cause and full answer to the question, to be the change which takes place in the nerves and tissues which compose this organ.

To the question, "What means are best for the prevention of this trouble?" he answers:—

"*First.* There must be a thorough knowledge of the intricacies of sympathy from and to this organ.

"*Second.* A knowledge of using means therapeutic to combat this abnormality.

"*Third.* Local treatment upon the organs involved when they are within reach.

"*Fourth.* Perfect cleanliness of the teeth, in order to locate the cause of decay.

"*Fifth.* Confidence in yourself that you are equal to the emergency, and the like confidence in you on the part of the patient.

"We can thus do an immense amount of good, and reduce the ratio of decay of our females to that of our males."

At the conclusion of the essay, the Chairman announced the committee contemplated by the resolution of Dr. McManus, to prepare a formula for tooth powder. The following gentlemen were named: Drs. Watt, Buckingham, McManus, and Chase.

The Association then adjourned until four P.M.

OPHTHALMIC SURGERY.

At about half-past two o'clock P.M. a large delegation of the members of the Association attended the Desmarres' Eye and Ear Hospital, to witness operations upon the eye.

Having arrived at the hospital, the patient was placed in position, and while he was being put under the influence of an anæsthetic, Dr. Hildreth occupied the time in stating his experience in the use of anæsthetic agents. He had a decided preference for the use of ether in all cases of operations upon the eye. He considered it entirely safe in prudent hands, and thought it the only agent that was safe where such a perfect state of anæsthesia was required. He briefly related experiments with sheep, cats, rabbits, etc., stating that they seldom, if ever, died from the effects of ether, while death is very common under the use of chloroform. He said that Dr. Brinton, of Philadelphia, had tried to kill sheep with ether, and could not do it; but they died very readily when chloroform was administered. There were over three hundred cases recorded of death from chloroform, while there was not one authenticated case of death from ether. The ether which he used was manufactured at the Army Laboratory at Philadelphia, for government use. This could not be obtained for private practice, but that prepared by Nichols he considered very pure and excellent.

The highest state of anæsthesia having been produced, Dr. Hildreth, assisted by Dr. Gleason, proceeded to perform the operation of *Iridectomy*, or what is known as the operation of *déchirement*, which means tearing, and was first reduced to an easy practical operation by Desmarres. This delicate operation was performed on both eyes of the patient, in the presence of about fifty of the members of the Association, who were highly delighted with the skill with which it was performed.

The patient was practically blind, but the doctor expects to so far restore his sight by his operations, that he will be able to read. He has

performed the operation fourteen times within the last six months, with most happy results.

THIRD DAY.—*Afternoon Session.*

At the appointed hour the Association was called to order, and the minutes were read and approved.

Dr. Buckingham then read a paper by Dr. Geo. T. Barker, on "Symmetrical Diseases of the Dental Organs."

But little notice having been taken in the dental publications of this peculiarity in the manifestation of diseases, the paper in question was prepared to call attention thereto. The term "symmetrical" being defined as applying to those parts of the body which, situated on both sides of the median line, exactly correspond to each other, and are analogous in their diseased conditions, the writer enters somewhat into a statement of the causes from which these results arise, and which, with the exception of congenital defects, he attributes to some morbid material in the blood. Numerous confirmatory cases are cited, and especial attention drawn to the proneness of teeth to decay in pairs. From the examples quoted, the doctor concluded that the only parts of any organ or tissue that are identical are those located in symmetrical positions on the opposite sides of the body, and that these parts are liable to be acted upon simultaneously by any morbid influence if it exists in the nutritive fluid.

Dr. McQuillen followed with the citation of a case of a Union soldier, wounded in the battle of Cold Harbor, one of the battles near Richmond, by a fragment of shell, which carried away a portion of the under jaw and most of his teeth, leaving a V-shaped fissure in the upper lip, while the remains of the lower lip had fallen into the mouth and become adherent to the jaw and tongue. He narrated the attendant circumstances, and the treatment which he had adopted after the patient had been deprived of speech, and when respiration and deglutition were exceedingly difficult, and mucus, pus, and saliva flowed constantly from his mouth and beyond his control. The case was a novel one, and the mode of treatment excited deep attention. Photographs of the patient before and after the surgical operations which the doctor had performed were presented.

Dr. Chesebrough exhibited a number of specimens of the upper and lower jaw of a fœtus at the age of seven or eight weeks, and also at five and six months. These specimens showed the growth of the maxillary bones during uterine life, and that even at the early age first indicated the germs of the teeth were perfect and readily distinguishable, and at the latter age the cusps of the teeth were easily seen, and in their form were of the shape in which they appeared at the time of eruption after the birth of the infant.

Dr. Atkinson followed in remarks upon the etiquette which should be

exercised by members of the profession toward surgeons, and where the line of demarkation should be drawn at which the dentist should cease his efforts and the surgeon should begin; and claiming that in many instances the dentist understood cases growing out of fractures of the jaw, and portions contiguous thereto, even better than the professional surgeon. The doctor cited two or three cases which had come under his immediate observation, in which the skill of the dentist had built up—where the want of comprehension on the part of the surgeon had nearly destroyed—the parts treated. He particularly enjoined that warm poultices should never be applied to fractures or the seat of any inflammation.

Dr. Sheffield exhibited necrosed portions of the jaw-bone of a child of the age of six years, as showing the evil effects of poulticing. He removed the portions of necrosed bone, and the child recovered.

Dr. Morgan also cited a similar case, and Dr. Freeman, of Aurora, narrated the case of a young lady in his own locality, in which the use of warm appliances and fomentations had produced abscess and necrosed bones, resulting in permanent deformity.

Dr. Atkinson continued the subject of dental pathology and surgery, combating the idea that when the pulp or nerve of the tooth was exposed death of the dental organ was the inevitable result. He described two cases, in the practice of Dr. Allport, in which the pulp had been operated upon and built over with the happy result of preservation of the life of the pulp of the tooth, as proven by subsequent removal of the filling. Speaking of the cutting off of parts of the pulp and branches of nerves, he said if they were simply wounded and brought in contact again, they might be healed by first intention. He had never seen a case of an exposed pulp, where the deposition of secondary dentine had occurred, if not begun within a month of the exposure.

Dr. Perkins, of Albany, said he had been extravagantly in favor of the preservation of exposed pulps. He had filled a great many teeth where the nerve had been exposed, capping with Dr. Hill's stopping. He was still in favor of treatment for preservation where there was a reasonable hope of success. But those cases, from his experience, were very rare.

Dr. Stone, of Louisville, never saw a case where there was an ossific deposit and the tooth got well. The idea of capping nerves, he said, was obsolete, and the theory of the recovery of a nerve after it had been once wounded was nonsense. He did not say that the pulp would die immediately; by careful treatment it might possibly be preserved some time, but it would eventually die, and a pulp once wounded could never again become healthful. The proper method was to destroy the pulp, and be certain that it is removed, and fill up the cavity. Expose a nerve, and it was but a matter of time whether the tooth should be saved or lost. A healthy tooth, with nerve extirpated, could be treated with much certainty of saving it for a term of years.

Dr. Butler stated that if a section of soft tissue were cut off, no one would question that the wound would heal by first intention if the parts were brought perfectly together. Why, then, he asked, may not the same thing occur in the case of the wounded pulp?

Dr. Stone, of Louisville, mentioned a case of alveolar abscess of eight years' standing, which he treated by thoroughly cleansing the tooth and adjacent parts, and injecting creosote into the root until it discharged from the fistulous opening. The discharge of pus having ceased, he filled the tooth and root, which continue well to this day.

Dr. Allport confirmed this statement, the patient having come under his care since his removal to Chicago. The doctor then presented an invitation from the Board of Public Works, tendering the Association an opportunity of visiting the lake tunnel and crib.

On motion of Dr. Chesebrough, the thanks of the Association were tendered to all who had honored them with their kind attentions.

Dr. A. Lawrence presented an invitation from Mrs. Green, of 117 Lake Street, to visit her gallery of paintings, which was accepted, and the thanks of the Association returned.

Dr. F. Y. Clark read a paper on "Diseases of the Dental Pulp and their Treatment," containing the details of his modes of procedure in various phases of these disorders. He contrasted the practice of the present day with that of the past, when extraction in such cases was as much the rule as it now is the exception. In cases of simple exposure, without inflammation, he found the results from use of arsenious paste were usually successful, and unaccompanied by pain, the pulp being removable at once. In congestion he considered it useful to deplete the pulp by bleeding before making any application. In cases of fungoid growth he preferred the use of the instrument for extirpation. Alluding to a class of teeth in which the pulp has been converted into morbid matter, with discharge through the tooth, and an entire absence of fistulous opening, the doctor says he cleanses the fang by a series of washings and dressings with creosote for a few days, after which, if all signs of discharge have ceased, he plugs the fang with compressed hickory-wood dipped in creosote, and then fills with tin foil. If, after plugging, alveolar abscess threatens, he first resorts to electricity, next to incision at the end of the fang, filling the wound with a bit of cotton; these means failing, "his efforts are directed toward the encouragement of suppuration." Where alveolar abscess exists with a fistulous opening, he evacuates the impure matter, dresses with creosote, and fills the fang. The doctor believed some points in his treatment peculiar, and offered them for trial by all, with the admonition of the apostle, "to prove all things, and hold fast to that which is good."

The paper was referred to the Committee on Publication.

Permission was then granted to Dr. I. J. Wetherbee to make a state-

ment regarding the "Dental Protective Union," the claims of which he briefly urged.

The President then announced that the members of the Association were invited to the residence of Dr. N. S. Davis, at nine o'clock, prior to which Dr. McQuillen would deliver a lecture in this hall upon the "Circulation of the Blood." The operators announced for the morning clinic were Doctors Chesebrough, McQuillen, Morgan, Hunt, and Atkinson.

The Association then adjourned.

LECTURE ON THE CIRCULATION OF THE BLOOD.

The Association convened at eight o'clock, pursuant to adjournment, to listen to a lecture which was delivered by Dr. McQuillen upon the "Circulation of the Blood," with special reference to the teeth. The lecture was illustrated by showing the capillary circulation in the web of a frog's foot under the microscope, and also by the performance of a vivisection on a frog, whose heart continued to pulsate long after decapitation and the opening of the thorax of the animal. One of the main efforts of the speaker was directed to the treatment in cases of hæmorrhage from the extraction of teeth, and to prove that instances of "bleeding to death" were inexcusable, as they could be prevented by timely precautions.

Dr. Perkins, of Milwaukee, thought Dr. McQuillen was too decided in his assertion that death from hæmorrhage attendant upon the extraction of the teeth was not only inexcusable but culpable. He believed that instances might occur in which an operator could not be held accountable for unfortunate results; and in support of this mentioned two cases which came near proving fatal. He then asked what should be done in cases where all local applications proved unavailing.

Dr. McQuillen said that fully recognizing as he did the fact that persons laboring under the hæmorrhagic diathesis are liable to the most profuse and alarming hæmorrhage from the slightest injuries, and that in such cases trouble was to be apprehended in the extraction of teeth; still, taking into consideration the facility with which *compresses* could be applied over the bleeding surface, and retained *immovably* in their place by a proper bandage passing under the jaws and over the top of the head, and the hæmorrhage thus controlled, he could but reiterate that which he had already uttered. In cases where such efforts might fail, the ligation of the *primitive carotid*, in the middle triangle of the neck, would completely arrest the hæmorrhage. For his part he could wish most earnestly that every dentist was fully prepared to meet just such emergencies, but until they all are, those who are not, must rely upon the surgeon.

After the delivery of the address, the Association adjourned to Dr. Davis' residence, and to meet in convention at the usual hour the next morning.

FOURTH DAY.—*Morning Session.*

The President called the meeting to order at half-past ten A.M. The minutes of the last session were read and approved.

Dr. John Allen read a paper on Dental Ethics, which subject was commended to this Association for its action by the New York Society of Dental Surgeons; the paper was referred to the Publishing Committee.

Its principal features were: First, that dentists, as a body, should take so high a position, morally and professionally, as to be looked up to with respect and confidence. Second, that in all social and professional gatherings strict decorum should be observed, and in debate all personalities and sarcastic remarks be avoided. Third, that when dependent upon each other for professional aid no charge should be made except for expenses incurred. Fourth, that when officiating temporarily for another practitioner due regard should be had for his interests and character; pecuniary considerations being awarded as circumstances may dictate. Fifth, that in consultations all due respect be paid to the dentist in charge; no rivalry or jealousy to be indulged; discussions on doubtful points not to be carried on in the presence of the patient, and the result to be communicated by the dentist in charge of the case. Sixth, that in regard to pecuniary considerations general rules should be adopted by State and local societies, which should be adhered to as a point of honor by all connected therewith. Seventh, that patents do not advance the best interests of the profession, nor of those obtaining them, and that some more acceptable plan should be adopted for the encouragement of inventions valuable to the dental community. Eighth, that a proper deportment to patients, and reasonable indulgence of their peculiarities, should never be overlooked. Ninth, that dentists should refrain from boasting of the operations they may have performed, as in bad taste, and possibly offensive to the patients referred to. Tenth, that in return for the honorable discharge of his duties, the dentist is entitled to a due appreciation of his qualifications, and a proper discrimination between the scientific operator and the ignorant pretender on the part of the public; and that the profession is entitled to aid and encouragement in building up institutions for dental education, in which with the community it is equally interested.

The report of the Nominating Committee was now presented and adopted.

The following are the committees as confirmed by the Association:—

Committee of Arrangements.—Dr. B. S. Codman, Boston; Dr. L. D. Shepard, Salem, Mass.; Dr. A. Lawrence, Lowell.

Committee on Publication.—Dr. J. H. McQuillen, Philadelphia; Dr. W. C. Horne, New York; Dr. C. P. Fitch, New York.

Committee on Prize Essays.—Dr. Isaiah Forbes, St. Louis; Dr. Geo.

L. Paine, Xenia; Dr. I. J. Wetherbee, Boston; Dr. T. L. Buckingham, Philadelphia; Dr. A. S. Talbot, Lexington, Ohio.

Committee on Dental Physiology.—Dr. H. S. Chase, Iowa City; Dr. Julius Chesebrough, Toledo; Dr. W. H. Morgan, Nashville.

Committee on Dental Chemistry.—Dr. E. Wildman, Philadelphia; Dr. H. A. Smith, Cincinnati; Dr. T. L. Buckingham, Philadelphia.

Committee on Dental Pathology and Surgery.—Dr. C. W. Spalding, St. Louis; Dr. W. H. Atkinson, New York; Dr. A. Lawrence, Lowell; Dr. C. R. Butler, Cleveland; Dr. W. Taft, Cincinnati.

Committee on Operative Dentistry.—Dr. J. A. Kennicott, Chicago; Dr. Jas. McManus, Hartford; Dr. W. H. Allen, New York.

Committee on Mechanical Dentistry.—Dr. Joseph Richardson, Terre Haute; Dr. T. Whitney, Buffalo; Dr. F. Y. Clark, Savannah; Dr. J. A. Perkins, Albany; Dr. E. Strong, New Haven.

Committee on Dental Education.—Dr. D. W. Perkins, Milwaukee; Dr. Geo. A. Mills, Brooklyn; Dr. L. D. Shepard, Salem, Mass.

Committee on Dental Literature.—Dr. A. Hill, Norwalk; Dr. A. Berry, Cincinnati; Dr. F. Y. Clark, Savannah.

Committee on Voluntary Essays.—Dr. Geo. Watt, Xenia; Dr. J. W. Ellis, Chicago; Dr. W. O. Kulp, Muscatine.

The report of the Committee on Operative Dentistry was called for. There was no report.

The discussion of the subject being now in order,

Dr. Peebles expressed his pleasure that Operative Dentistry had at last been reached. There was a great deal about it that he wanted to learn; for instance, how to extract all the pulp of a tooth at once. It was easy for any one to talk about his successes, but he wanted to hear of the failures, so that they may be avoided in future. He had heard of some operatives who extracted successfully fifty or sixty teeth per day. He thought such success disgraceful.

Dr. Ellis was glad to find that there were some who had the courage to talk of failures. He believed that there were some people whose teeth should be extracted at once, as they are incapable of appreciating the effort to cure them or arrest decay. But ordinarily, it was much better to fill a tooth than to extract it; the difficulty was to find a method of insuring success, as he never assured a patient that he might not expect future trouble with a dead tooth. It was nonsense to talk about security; all that the practitioner could do was to promise to do all he could in case of future trouble. He ridiculed the idea of what are called "fancy operations"—building out corners was very pretty work, but not always permanent.

Dr. Fitch, of New York, said that dental operations were not necessarily successful any more than the treatment of surgical cases; in each instance the operator had to deal with organized structures—vital tissues

—and these differ in different organisms, so that no specific rule will apply in every case. With debilitated persons he would first adopt constitutional treatment before undertaking an operation. If the individual is in good condition, cleanse the tooth from all morbid matter, and the operation following will be successful. He considered it better sometimes to use anæsthetics than arsenic, though he had no aversion to the use of arsenic. The best filling to put into a root was cotton moistened with creosote, and well compacted; he would not have much surplus creosote, but if there was any it would escape through the dentinal tubuli.

Dr. Stone had many callers whose teeth he would not treat in any way; people who would not take care of their gums and teeth had better submit to extraction at once; it is all they can appreciate. If there is any vitality in a tooth it can be saved. He treated all his cavities with creosote, whether the nerve be exposed or not. It was very important to remove every particle of diseased matter about the tooth. When a tooth has become blackened after loss of the pulp, he considers it past any treatment or cure.

Dr. Kennicott wished the file and the forceps could be forever banished from the profession. He was surprised at the large number of teeth which members were willing to sacrifice. The duty of the dentist is to save teeth wherever possible, and in cases of exposed pulp nine out of ten might be saved. He found arsenic, morphia, and aconitin extremely useful, the latter to be added to the arsenious paste; the aconitin paralyzes the pulp while the arsenic destroys it. He had tried *veratrum viride* with astonishing success; it will stop toothache instantly or allay inflammation. All of these medicines he seals up with a mixture of wax and rosin, charging the patient to eat no solid food before the next sitting. In cases of simple exposure he uses a small concave cap of pure gold, the concavity filled with purified gutta-percha dissolved in chloroform. This makes an air-tight protection without impinging on the nerve, though on removal a perfect impression of the pulp is discovered. Over this cap a gold filling of the most solid character may be introduced.

Dr. McQuillen said he believed that *all practitioners* had their failures, those who claimed to be *immaculate* to the contrary notwithstanding. The failures of first-class men, however, were so slight in proportion to their successes that the former could not be charged against them as the result of *incapacity* or *carelessness*, but were due as a general thing to circumstances over which they had no control. An average of success such as this was not the result of mere *chance*, but was due to a knowledge of and a strict adherence to *principles*; for in dental operations as in all other human efforts there was an underlying basis of principles. He had with him a paper on "DENTAL MANIPULATIONS," which treated the subject in this light, and if it was agreeable to the Association he would read it.

Permission having been granted, the paper was read, and the views presented in it, if followed strictly by dental practitioners, are calculated to insure a fair measure of success to all who would adopt them. He portrayed the facility and precision with which the skilled operator performs the most difficult and delicate manipulations in contrast with the poor fellow whose fingers are all thumbs. He urged the necessity of reiterated efforts for the attainment of excellence in the varied duties of the dentist's specialty. A clear head, a keen eye, and a firm and steady hand were indispensable qualities on the part of an operator, and he who lacked any of these would not be likely to produce results of a very high order.

At the conclusion of the paper, the doctor said that his operations were performed entirely by hand pressure, and although he did not wish to be understood as opposing the use of the *mallet* on the part of those who felt that they could not get along without it, he did object most emphatically to the strong terms of denunciation employed against those who could succeed in obtaining perfect results without it. We are informed that teeth were never properly filled until the mallet was revived. But when he looked back upon the labors of Hudson, Townsend, Maynard, Neall, Dunning, Dwinell, and many others too numerous to mention, whose fillings were introduced by hand pressure, and after a lapse of ten, fifteen, and thirty years, were found standing as perfect as the day they were finished, and when he saw the greater portion of his own work performed within the past eighteen years presenting the same appearance, he could see no just reason for changing his mode of practice, however much others might denounce it. We are told that patients do not object to the mallet when it is properly used, yet he had been informed by some patients who had submitted to the manipulations of its most earnest advocates and those most experienced in its use, that rather than submit to such torture as that which they had endured under its infliction, they would prefer to lose their teeth. As he had said in his paper, dental operations at the best can never be made agreeable, but he thought that we should try to make them as easy as possible *consistent* with securing *perfect results*. Again, if one person could succeed in saving a tooth by hand pressure in the same time that it took two or more to do it with the mallet, there was that much gained for the assistants, who could be employed in doing something else. Lastly, the presence of third parties was exceedingly objectionable to some patients, and the necessity of observing a just regard for their wishes in that direction must be evident to every man possessed of a proper sense of the *rights* of others. He should not have expressed himself thus freely on this subject (for he had no disposition to controvert the practice of others when they succeeded in obtaining favorable results) but for the strong terms of denunciation that have been constantly indulged in toward those who, succeeding without the mallet, do not think it necessary to adopt its use.

Dr. Atkinson reminded the Association of the position long maintained by him, that gold was capable of being welded at a low temperature. He then exhibited a wire of pure gold, very ductile, of about eighteen inches in length. He stated that Dr. A. Lawrence had, with ordinary soft foil, made a finger-ring of layers laid round the handle of an instrument and condensed with serrated instruments; the ring was worn for a time, and then, to carry the experiment still further, was hammered down, and passed through a wire plate. The doctor considered this a triumphant vindication of his theory. He then referred to Dr. Lawrence's amalgam, saying, if used as he directs, with the cavity prepared as it should be, it would last for ten lifetimes. Yet he did not advocate the use of amalgam, but he considered the material of less consequence than the manner of its use. He was not a greenhorn on filling teeth, he did it with his might. Wherever there was a difference of opinion on matters which were demonstrable, it was because there was a difference in the degree of intelligence.

In reference to the use of hand pressure versus the mallet, the doctor loudly extolled the latter at the expense of the former, and characterized the objectors to spectators of office operations as men who loved darkness better than light, because their deeds were evil.

Dr. Perkins strongly denounced Dr. Atkinson's remarks as insulting to the assemblage.

Dr. McQuillen, in reply to Dr. Atkinson's last remark, would only quote the language of the gallant Prince who originated the motto and established the English Order of the Garter, "*Honi soit qui mal y pense*"—evil be to him who evil thinks.

Dr. A. Hill remarked that, as a matter of course, varying results were obtained the world over. There were advantages in clinics which discussions could not afford.

Dr. Mills attributed failures almost entirely to imperfect manipulation, not to errors in theory. A very great improvement had been made in the manufacture of dental instruments, and this had a marked bearing on the perfection of operations on the teeth. The doctor read his views on the wedging of teeth from an article printed in one of the dental journals.

Dr. Horne called the attention of the Association to the utility of Dr. Barnum's application of pure sheet rubber for isolating a tooth from moisture during the operation of plugging. This consists in puncturing or cutting a small hole in a piece of the rubber, three or four inches square, this to be forced over and around the tooth, with the edges turned upward to the gum; if the teeth are near together, other holes must be made so as to include the teeth on either side of the one to be filled. By this means the plug will be kept dry during an operation of several hours.

The Association adjourned to the usual hour.

FOURTH DAY.—*Afternoon Session.*

The Association met at three o'clock. President Spalding in the Chair.

The Chairman of the Publishing Committee, Dr. J. Taft, stated that 250 copies of the "Transactions" of the last session had been printed, and 200 copies bound and distributed to members entitled to receive them. The following is the Committee's account with the Association:—

REPORT OF PUBLICATION COMMITTEE.

The Publication Committee in account with the American Dental Association.

DR.	
To balance on hand at last report	\$34.17
To amount received for sale of Transactions.....	6.00
To amount received of Treasurer	160.00
	<hr/>
	\$200.17

CR.	
By amount paid for publishing Transactions of 1865.....	\$235.00
In postage and express	15.00
	<hr/>
	\$250.00

Balance due Committee..... \$49.83

J. TAFT, *Chairman Committee on Publication.*

The report of the Committee was adopted, and the balance ordered to be paid.

In the absence of Dr. I. J. Wetherbee, owing to indisposition, Dr. I. C. Fuller was elected Treasurer *pro tem.*

On motion of Dr. Perkins, it was resolved that the annual dues for the next year be five dollars.

Dr. Forbes suggested that the proper way would be for the local societies to bear the expenses of the General Association.

On motion of Dr. W. W. Sheffield, the following was adopted:—

Whereas, The members of the American Dental Association learn of the intention of Dr. Julius Chesebrough to remove from among us to locate in the Republic of Chili, South America: therefore

Resolved, By this Association, that as a body we can appreciate the labors of Dr. Chesebrough for the advancement of dentistry, and regret that he is about to leave our midst, and that we can cheerfully yield our testimony and indorsement to the high position he has gained among us.

Dr. Chesebrough expressed his thanks to the Association for their action, and promised that the result of his investigations in his new field of labor should be laid before this Association.

On motion of Dr. Allport, a vote of thanks was tendered to Mr. Crosby, for a donation of twenty dollars, from the rent of the room, to the funds of the Association.

Dr. F. Y. Clark exhibited a pair of ebony blocks for folding foil.

Dr. J. C. Dean exhibited a lamp, of his own invention, for heating water and annealing foil in the operating-room.

The report of the Committee on Mechanical Dentistry being called for, Dr. John Allen, of New York, presented the report, of which the following is an abstract:—

After inquiring into the fitness of the term as applied exclusively to the operations connected with the adaptation of substitutes for the natural teeth, he suggested the term "*Artificial Dentistry*" as far preferable. A narration followed of the principal substances now in use in this department of dentistry, with a statement of their respective claims, and an appeal that artificial dentistry should be advanced in a degree commensurate with the improvements in the operative branch.

Referring to the group of metals known as iridium, rhodium, ruthenium, osmium, and platinum, the doctor remarked of the last named, that combined with a very small quantity of iridium or rhodium, it attains sufficient stiffness for dental purposes. Rhodium and osmium, forming the hardest alloy known, are very infusible. Excepting platinum, the general characteristics of these metals are their hardness, while they are all strongly alike in resisting the action of heat and acids, and thus have all the properties that can be desired in bases for artificial dentures. The doctor's own experience in using them, for whole and partial plates, had been highly satisfactory.

In reference to the construction of artificial palates, the doctor said: "We are indebted to Dr. N. W. Kingsley for the most perfect device of this kind."

A paper on Hard Rubber, by Dr. Wildman, was presented and read by Dr. Buckingham, giving the results of some of his experiments, analytical and synthetical. Finding the manufacturers of the rubber compounds for dental purposes extremely reticent as to its composition, and but little more knowledge to be gained from the specifications of the patents, the doctor instituted a series of experiments to obtain a better knowledge of the value of the different compounds vended for the use of dentists. A number of experiments are detailed to test the amount of earthy matter in different rubbers found in the market; of these the American Hard Rubber Company's left five and four per cent. respectively of ash, one of the doctor's make three per cent., while the English rubbers and others of home manufacture left a residuum of from forty to sixty per cent. when brought to a white heat. Proceeding with the process of manufacturing different samples, we learn that in making rubber compounds the caoutchouc may be mixed with sulphur and the coloring matter by being passed repeatedly between steam-heated rollers, or, for experimental purposes, the caoutchouc may be first reduced to a pulpy state by some one of its solvents, and the sulphur and other substances—

being previously ground very fine—thoroughly incorporated with it. The solvents used are naphtha, benzine, or oil of turpentine, which are afterward evaporated by exposure of the mixture to the air on plates of glass. Several different compounds, of various colors, are described in their composition. Caoutchouc being the cement which binds all the materials together, a glance at the accompanying table will show the great inferiority of the English pink to either the brown or red rubber for dental purposes. When the composition contains but a small proportion of this cement, its weakness of texture would render it liable to produce injurious effects by its susceptibility to abrasion in the mouth. The following table gives very nearly the percentage of caoutchouc contained in the doctor's formulæ, and also that of the English pink rubber:

	Caoutchouc.	Sulph.	Verm.	Sul. Cad.	Ox. Zinc.	Parts in
Brown	66 $\frac{2}{3}$	33 $\frac{1}{3}$	—	—	—	100
Red	44	22	33.0	—	—	99
Yellow	44	22	—	33.0	—	99
Pink	42 $\frac{2}{3}$	21 $\frac{1}{3}$	9.0	—	27	100
Buff	35.4	17.7+	7.3	4.4	35.4+	100
Drab	44	22	—	—	33	99
Light	28.5+	14.3+	—	—	57.1+	100
					black.	
Black	50	25	—	—	25	100
Yellow	40	20	—	—	40	100
					white earthy matter.	
English pink	24	12	.18	—	48	102

The report of the Committee on Dental Education, by Dr. Taylor, was read by Dr. Shepard; and together with the above-named papers, was referred to the Committee on Publication.

The following is an outline of the report:—

The Committee congratulated the Association on the increased attention to the interests of education on the part of the profession; they considered the meetings of the dental societies as eminently conducive to the development of excellence in the practicalities of dentistry, and of great power in removing prejudices and dispelling ignorance. The Committee called especial attention to office and collegiate instruction. In the former they complain that there is sad neglect of intellectual training, the great desideratum with many practitioners being mechanical tact, while they urge that every member of the profession should be a scholar and scientific operator. Of the five dental colleges, the committee express the hope that they may all be more liberally sustained, as institutions embracing a large amount of working talent, which if properly directed and co-operative must produce results of great good. Various suggestions are made as to the character and duration of college studies, with a view to bring to notice the present condition of dental education. Of the press they say that it is in good condition, having almost killed the monster quackery.

The Committee on Dental Literature presented no report, the chairman not being in attendance.

Dr. Forbes moved that each society represented in this Association be requested to prepare a paper on some subject to be presented at the next meeting. He said that in St. Louis each man was expected to stand on his own feet, and tell what he *knows* on a subject, and then to write it; it might be but two lines, but it was written, and weak brethren were benefited. Let each society do this, and the sense of each be sent in a paper to this Association. Motion lost.

The Committee on Voluntary Essays made no report.

The subject of Mechanical Dentistry being now taken up, a few gentlemen indulged in desultory remarks on that topic.

Dr. F. Y. Clark, of Savannah, Georgia, condemned the use of rubber *in toto*. He said that when Sherman's army came into Savannah, there was work enough to employ one hundred dentists for six months. The exhibitions then made disgusted him with rubber. He used none but gold plates. He showed a perforated cup of brass for taking an impression; and a flask in which the impression and cup could be set, and the metal for the male die poured directly into it; thus saving much labor, and securing a more correct die.

Dr. Atkinson then moved that the reports of Local Societies be taken up. Carried.

Dr. Horne then read a report from the Brooklyn Dental Association, Dr. Chase from the Iowa Society, and Dr. Dean from the Chicago Society.

Miscellaneous Business now being the order,

Dr. McQuillen said that he was not present when the Nominating Committee presented their report, or he should have objected to serving as chairman of two committees; he did not think it was proper for any member in an association as large as this, to be on more than one committee; he would therefore beg leave to withdraw from the Committee on Dental Literature.

This was granted, and Dr. A. Hill was appointed chairman, and Dr. F. Y. Clark, of Georgia, to fill the vacancy in the committee.

Dr. Snow, of Buffalo, exhibited a blow-pipe of his own invention, for fusing and soldering metals.

Dr. Danforth, of Jamestown, N. Y., exhibited a pair of adjustable forceps, and a press for trueing corundum wheels.

The subject of devitalizing pulps was then referred to by Dr. Atkinson, who recommended chromic acid as an escharotic; the difficulty in keeping it being the only objection. It effects the work instantaneously, and does not produce pain; it must be used with great care, and not allowed to come in contact with the soft tissues, into which it plows deeply. It was first suggested to him by his assistant, Dr. T. Rowe. He had seen

terchloride of gold used; but did not adopt it on account of its expensiveness and evanescence. He was also indebted to Dr. R. W. Varney, a former pupil, for the idea of mixing creosote and iodine, producing the compound which he denominated "big nigger."

Dr. M. W. S. Sherwood gave a recipe for devitalizing the dental pulp, which he received from the late Dr. C. C. Allen, of New York, and had long used with great success, consisting of three parts each of narcotine and tannin and one of arsenic.

Dr. Kennicott protested against the use of arsenic in any form for devitalizing pulps.

Dr. A. Hill stated the proper manner of using his "stopping." It should be warmed by a dry heat, on a porcelain or metal plate, not in water, nor by a flame, either of which processes would spoil the material.

The session was then adjourned to half-past eight P.M.

FOURTH DAY.—*Evening Session.*

At half-past eight o'clock the meeting was called to order by the President. The consideration of Miscellaneous Business was resumed.

On motion of Dr. I. J. Wetherbee, a vote of thanks was tendered to the Committee of Arrangements, for their attention to the duties of their position, and to the entertainment of the members of the Association.

It was also resolved, on motion of Dr. A. Hill, that the thanks of this Association be tendered to the reporters of the press who have been in attendance during the sessions of this Association, and reported so accurately and efficiently the proceedings and discussions of this body.

Dr. Salmon, of Boston, asked to be excused from serving on the Committee of Arrangements. He was excused, and Dr. B. S. Codman appointed in his place.

Dr. Nichols exhibited a rotating table for holding instruments.

Dr. Glen exhibited a standard and lamp for the use of kerosene in vulcanizing; its operation was clearly explained by the doctor; and a vote of thanks to him passed, he not being a member, and offering his instrument freely to the members of the profession.

Dr. McQuillen presented an interesting paper, which he had received from COL. JOHN LEWIS, of the Invalid Corps, who was formerly a dentist, giving statistics of exemption from the draft for loss of teeth, and comparing our country with others in this respect. It was referred to the Publication Committee.

Dr. Buckingham exhibited some beautiful chemical experiments with magnesium, potassium, and sodium.

Dr. Atkinson moved the following:—

Resolved, That the Constitution and Transactions of this Association, from its formation to the close of the present session, be referred to the

Committee on Publication, to thoroughly revise and proof-read the same. Carried. Also

Resolved, That the said Constitution and Transactions, bound in one volume, be presented to each member of the Association who has paid his dues and assessments from the formation of the Association to the close of the present session. Carried.

On motion of Dr. W. P. Horton, it was

Resolved, That State, Local, and other Dental Societies and Colleges, entitled to a representation in the American Dental Association, be requested to send in an annual report, embodying such subject-matter as they may see fit, and that time be allotted for presenting such reports.

On motion of Dr. Buckingham, the Committee on Dental Literature had leave granted them to pass their report to the Publishing Committee when it should be finished.

Dr. I. Forbes presented a case from St. Louis, which was sent to this Association for its advice by the St. Louis Dental Association.

A committee of examination, consisting of Drs. Atkinson, Taft, Buckingham, and McQuillen was appointed. The committee proceeded to examine the case. Dr. Hildreth, of Chicago, was invited to join in the examination. After some discussion and examination, the following facts were elicited:—

The patient, a girl of fifteen, was taken from the St. Louis Hospital, where she had had the best medical attendance. The bones of the palate and nose, with the soft tissue and cartilages, were destroyed; the disease commencing at five years of age by ulceration of the throat. No indications appeared on any other part of the body, and the most industrious inquiries in regard to the parents' health had failed to discover anything to explain the patient's condition.

After much surmise, without arriving at any decision, the case was left in the hands of the committee.

At twelve P.M. the President declared the Association adjourned, to meet in the City of Boston, at ten o'clock A.M., on the last Tuesday in July, 1866.

EDITORIAL.

COMMUNICATIONS.

A NUMBER of valuable essays have been received from esteemed contributors, which it has been impossible to publish in the preceding and present numbers of the magazine, on account of a want of space. They will be presented, however, as promptly as possible in the forthcoming numbers. It is a source of pleasure and satisfaction to have received so many excellent communications, and it is trusted that the inability to publish them as promptly as they were sent will not prevent their authors from contributing frequently in the future. The quality of the

matter is just the kind that the profession *needs* and has been so earnestly desiring for some time past.

In this connection it may not be amiss to state, that the reports of the proceedings of societies are always acceptable, when prepared in a manner calculated to *instruct* or *interest* the profession; but the skeleton accounts too frequently forwarded, merely announcing that a meeting was held; the chair occupied by the President, Dr. —; such and such members were present; an able address was delivered by Dr. — on — subject, which elicited an animated discussion, participated in by the members generally, and so on to the end of the chapter, frequently occupying a page or more of printed matter, without giving the faintest idea of what was said or done by those present, constitute a class of communications which it will be impossible to present in the pages of the magazine in future, as it would necessarily occupy valuable space to the exclusion of more important matter.

The objects and aim of the magazine are *progress* and *utility*; in other words, to afford to the thinking and progressive minds of the profession a medium through which they may communicate to their fellow-practitioners new facts in science or practice, or a more acceptable and truthful description of old facts, whether presented in the form of oral communications or essays. In place, therefore, of the meager details referred to above, plain and concise accounts of the papers read before, and remarks made by, members of associations, are desired, as they tend, in place of barren and unprofitable words, to bear *fruit* which may serve as *mental pabulum* and *stimulus* to readers. Reporting the proceedings of societies affords excellent practice to young writers, who thereby exercise their memory and descriptive powers.

ERRATA.

IN a recent report of the *Connecticut Valley Dental Association*, owing to a typographical error, a paper read by Dr. Isaac Woolworth, of New Haven, on "The Past, Present, and Future of Dentistry," was credited to another person.

The name of Dr. W. C. Horne, of New York, was inadvertently omitted in the preceding number of the magazine as the reporter of the proceedings of the American Dental Association.

BIBLIOGRAPHICAL.

RESEARCHES ON THE MEDICAL PROPERTIES AND APPLICATIONS OF NITROUS OXIDE, PROTOXIDE OF NITROGEN, OR LAUGHING GAS. By GEO. J. ZIEGLER, M.D., Physician to the Philadelphia Hospital, Member of the

American Medical Association, Member of the Academy of Natural Sciences of Philadelphia, etc. J. B. Lippincott & Co.: Philadelphia, 1865.

Nitrous oxide, the subject-matter of the above work, will always be a theme of intense interest to the humanitarian, for although there may be a diversity of opinion relative to the employment of this agent as an anæsthetic in the performance of surgical operations, the unquestionable fact that by its aid Dr. Horace Wells, of Hartford, Conn., was first able to practically demonstrate that such operations could be performed with entire exemption from pain, will, like the discovery of Harvey of the circulation of the blood, and of Jenner of vaccination, environ it with a scientific interest as one of the greatest, if not the greatest boon granted to suffering humanity.

The object of the above work, however, is to direct attention more particularly to other properties of this valuable agent than the anæsthetic. Containing, as it does, a condensed summary of the experiments and investigations of a careful and philosophical observer, prosecuted from time to time during a period of sixteen years, they are entitled to a respectful consideration on the part of all earnest seekers after truth, for it is by such intelligent and honest devotion to a given subject, prosecuted for a considerable period, as has been the case with the author of this work, that the true properties of any agent can be determined. There is so much in medicine that is speculative, so many properties are ascribed to agents which do not belong to them, that it is not at all surprising that philosophical minds should be more or less skeptical with regard to much which is readily received as true by the illogical. Hence the advantage of data on which an enduring superstructure may be raised, adopting the Baconian principle of reasoning by *induction* from *cause* to *effect*, rather than starting with a preconceived and visionary opinion, which has no solid foundation in fact, and merely an existence in the brain of a dreamer, who too often, like a skillful lawyer interested in securing the cause of his client, presents everyting in the most plausible manner that may prove of advantage, and suppresses or opposes in the most determined manner all which would prove detrimental to it.

In the language of Sir Humphrey Davy: "Facts are independent of fashion, taste, and caprice, and are subject to no code of criticism; they are more useful, perhaps, even when they contradict than when they support received doctrines, for our theories are only imperfect approximations to the real knowledge of things; and in physical research doubt is usually of excellent effect, for it is a principal motive for new labors, and leads continually to the development of truth."

In the arrangement of the above work the matter has been treated of under the following heads: 1st. Chemical Constitution, Properties, and Correlations of Nitrous Oxide. 2d. Physiological Influence and Hygienic Uses. 3d. Medicinal Properties and Applications. 4th. Preparation

and Combinations. 5th. Mode of Administration and Dose. The observations and reflections of the author are presented in a clear and comprehensive manner. As he remarks in the preface, however: "These are necessarily incomplete, and to a certain extent inconclusive, yet it is hoped that they are sufficiently impressive to attract attention, and induce more enlarged effort to determine the sanitive value of this remarkable agent, and extend its sphere of usefulness in the preservation of life, promotion of health, and the relief of disease."

The work is deserving of a large circulation in the medical and dental professions.

THE NATURAL HISTORY OF THE HUMAN TEETH. In two Parts. By JOHN HUNTER, F.R.S. With notes by Francis C. Webb, M.D., F.L.S., Member of the Royal College of Physicians, London, Physician to the Great Northern Hospital, etc., and Robert T. Hulme, M.R.C.S., F.L.S., Lecturer on Dental Surgery at the Metropolitan School of Dental Science, and Dental Surgeon to National Dental Hospital. London: Robert Hardwick, Piccadilly, 1865.

The valuable labors of the eminent John Hunter on the human teeth are so well known to the dental profession that it would be a work of supererogation to present a review of them at this time; an additional value, however, has been given to his work in this edition, by the notes appended to the First Part of the work, which were furnished by Dr. Webb, and formed the basis of a course of lectures on the Comparative Anatomy of the Teeth, delivered to the students at the Metropolitan School of Dental Science. These notes, the editor states, were necessarily a work of compilation rather than of original research, and have been principally derived from the rich stores of information to be found in the works of Owen, Tomes, Nasmyth, and Kölliker.

The matter thus obtained has been arranged in an orderly and methodical manner, and will prove of decided advantage to students, to many of whom the expensive character of one of the works from which the material was obtained is such as to preclude the possibility of their being able to consult the original.

In the preparation of this work, however, it was a very great mistake not to illustrate it, for notwithstanding the disposition to ridicule what are called "picture books," there can be no question that the profuse illustrations of the text-books of the present day has tended greatly to facilitate the progress of students in every department of science, and the value of this work would have been much enhanced by their presence. The notes to the Second Part, by Mr. Hulme, are simply restricted to short comments on Hunter's views. As he remarks, to have attempted more, and to have brought this portion of the work up to the present

advanced state of dental surgery, would have necessitated the writing an entire treatise on the subject.

THE TEETH IN HEALTH AND DISEASE. By ROBERT T. HULME, F.L.S., M.R.C.S., Member of the Odontological Society of Great Britain, Corresponding Member of the Odontographic Society of Pennsylvania, etc. London: H. Baillière, 219 Regent Street, 1864.

In the preparation of this work, which was intended more for the public than the professional reader, and to correct the erroneous ideas popularly entertained concerning the teeth and their affections, the author has divested his descriptions, as far as possible, of all technical language, so that it might be the more acceptable and easily understood. Starting with this object in view, in 232 pages of a work he presents a concise account of the anatomy and diseases of the teeth.

Many members of the profession are opposed to the publication of popular treatises on professional subjects, and where the object and aim of the author is to make it a medium of advertisement it is certainly open to decided objection; but a valuable work like the one under consideration, written in a manner tending to awaken the minds of readers to the importance of preserving the teeth, is relieved of such objections, and cannot but prove of decided advantage to the community and the profession.

SELECTIONS.

NEW YORK TRIBUNE.

"A REVOLUTION IN MINING.—Gold and silver are very good things to have, provided they can be used, but Robinson Crusoe would have gladly swapped his lump of the yellow ore, a lump as big as his head, for its weight in tenpenny nails, simply because it was useless for his purposes. Gold and silver, whether in big lumps or little, add nothing to the wealth of a country, beyond a certain point, if to bring them into use costs more than they are worth. Our mineral wealth, enormous as it is, has these limits: first, that only a certain portion of it can be made available because of the cost of separating the precious metals from the ore; and, secondly, that a still larger portion is of no value, since they cannot be separated at all. Any process which shall cheapen the extraction of gold and silver from their ores will add immensely to our national means, and if it can effectually unlock those that are not now reached at all, a new source of wealth is opened to us of incalculable value. Dr. J. C. Ayer, the well-known chemist of New England, has recently hit upon a method of disintegration and desulphurization of ores, which, if it does all that is promised of it, will make not only the fortune of those who are connected with him in the ownership of the patents, but add largely to the

wealth of the nation itself. If this method shall prove successful, we are about to witness a revolution in mining which will so add to our national resources as to make not only the payment of the public debt an easy matter, but which will influence the commerce of the world.

"It is claimed for this new process that it is effectual in the disintegration and desulphurization of rock and ores by the application of liquid or liquid solutions while in a heated state. The rock or ore is rendered soft and friable and may be easily reduced to powder, while the volatile metals are, at the same time, expelled and the base metals oxydized. This leaves the gold and silver free for amalgamation.

"By the ordinary method of grinding and stamping rock, the gold therein contained is so comminuted that a large portion of it eludes the mercury and is lost. However finely the rock be pulverized, it is found, under the microscope, to be merely split into pieces or chips of stone, each of which contains gold within itself, beyond the reach of mercury, and which is, of course, lost. In the one case the metal is lost because it is itself ground and reduced too fine to be obtained; in the other, because it is not released at all. No successful method of overcoming these difficulties has hitherto been discovered, and, consequently, under the system of extraction now in use, miners only get about one-third of the gold therein contained.

"Dr. Ayer's process appears to obviate these difficulties; for, while it aggregates the precious metals into globules, by the natural action of heat, it destroys the molecular adhesion of the integral particles of the stone, rendering it friable like chalk. It, in fact, disintegrates the rock into its atoms, so that it may be easily rubbed up into powder. So effectual is the atomic separation that flint glass, or the hardest quartz or agate is made to absorb water like a sponge. Hence it is claimed that ores treated by it yield nearly all the precious metals they contain (over 90 per cent.) for the usual measure of extraction. The process not only destroys the rock without dividing the gold and silver, but also expels, by chemical action, any volatile metals, such as arsenic, antimony or bismuth, whose presence forbids amalgamation by mercury; while, if sulphurets are present, the oxygen of the decomposed water, used in the process, unites with the base metals, which remain as oxydes, and the sulphur, uniting with the hydrogen, goes off in clouds as sulphureted hydrogen. Hence mines that have been abandoned because they could not, although rich, be profitably worked, for any of the above reasons, may now afford a munificent return, and even the 'tailings' of the working mines yield more gold than has hitherto been obtained from the mines themselves by the old method. Highly sulphuretted ores are frequently among the richest that are found, but they have been nearly worthless, in consequence of the insuperable difficulties of extracting the metals from them. Now those difficulties appear to be wholly removed—difficulties which have locked within the rocks an untold amount of bullion. The great points gained then are:—

"1. The integral separation of stone into its atoms, which grinding, stamping or pulverizing can but imperfectly accomplish.

"2. Desulphurization of sulphuretted rocks and ores, and their purification from contaminating metals.

"3. Expulsion of the volatile metals.

"4. Oxydization of the base metals and separation therefrom of the precious metals held in combination.

"And, these points gained, it is estimated that the process will yield a working average, say, from eighty to ninety per cent. of the precious metals contained in any kind of rock or ore, and not less than twice as much as is obtained by any method now in use. But besides this there is an immense saving in the expense of mining, as the costly machinery and power for stamping are dispensed with, and the apparatus required is cheap, and may be built anywhere. The following estimate is made:—

The average cost of stamping machinery at the mines is \$1,000 per stamp. (One stamp can pulverize about one ton per day.)	
The average cost of machinery to stamp 100 tons per day.....	\$100,000
The average cost of furnaces to disintegrate and desulphurize 100 tons per day.....	20,000
Saving by this process, of capital invested, for 100 tons per day...	\$80,000
Assuming that 100 tons of ore are worked daily, containing \$100 per ton, they would yield by the stamp process, say 30 per cent..	3,000
The same amount by this process, say 80 per cent.....	8,000
Daily difference in favor of this process.....	5,000
Thus, on an amount of 100 tons per day, there is not only the saving of \$80,000 in the first investment, but also a daily saving of \$5,000 in the yield.	

"The results arrived at so far have been attained through a course of careful experiments upon considerable quantities of rock, and to the perfect success of these Dr. Hayes, the State Assayer and Mineralogist of Massachusetts, Professor Silliman of Yale College, and Professor Torrey, U. S. Assayer of the Mint in this city, testify in the most unqualified manner. Whether the same results will be reached by practical application of the process on a larger scale at the mines, remains, of course, to be seen. So great is the confidence felt in it, however, among capitalists and practical men, that a company has been formed in this city under the title of the 'Chemical Gold and Silver Ore Reducing Company,' of which Major-General Butler is President, and other substantial men Trustees.

"At their office, No. 64 Broadway, they offer their discovery to the public, and their stock and royalties for sale.

"The subject is attracting, we understand, a good deal of attention among those interested in mining. Its importance can hardly be over-estimated, if no unforeseen obstacle shall be developed in the practical operations of the process.

"If this invention can accomplish what appears to be fairly claimed for it, viz., that it more than doubles the yield of the precious metals from their ores, at a reduced cost of extraction, then it is not a wild prediction that within five years our mining interests will have so extended and developed themselves that this increase alone upon their product will pay the interest of our national debt. By one of the singular coincidences which seem too pertinent for chance, Petroleum came in when Cotton failed to balance our exchanges with the world; and may we not reverently believe that the unlocking of the exhaustless treasures which our rocks contain, when we are called to pay the immense cost of eradicating our great national sin, is the timely gift of an overruling Providence? Surely our history is showing that, with nations as individuals,

'There's a Divinity that shapes our ends,
Rough hew them as we will.'

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"On the First Formation and Development of Cartilage. By PROF. ADOLPH HANNOVER, M.D., of Copenhagen.—In my memoir on the development and structure of the teeth of mammifera I have shown that the formation of the cement, or bony part of the tooth, takes place through the cement germ, in a peculiar and hitherto unknown manner, by a threefold process. In the first stage the cement germ presents, as PRIMORDIAL GERM, a limpid, clear, or slightly reddish fluid; the only solid bodies which occur in this substance are the primordial cells of the cement germ. These cells are round, more rarely oval, very pale and delicate, almost without molecules, but provided with a middle-sized, round, or oval, less frequently angular nucleus, which has the appearance of a separate vesicle, and generally contains a dark, punctiform nucleolus. After the cement germ has attained a slightly gelatinous consistence, the primordial cells begin to change, so that the cell membrane sends numerous prolongations out toward all sides, and the cells become branched or stellate. From the prolongations finer branches are given off, which inosculate with those of the neighboring cells; the cell membrane itself begins to disappear, the nucleus becomes darker, and the nucleolus is more frequently visible than before. The cement germ now becomes more consistent, and a transparent, structureless, intercellular substance begins to form, in which the stellate cells are deposited in various layers and inosculate with each other; but as the size of the cell membrane is diminished, the branches seem to proceed from the large, round, oval, or elongated nuclei. At last the cell membrane disappears thoroughly, and the original prolongations are transformed into very fine, smooth, slightly curved, rarely stiff or straight fibres, collected into bundles, parallel or irregularly disposed. The nucleus also disappears by degrees, and leaves no vestige. Thus closes the primordial stage of the cement germ. It becomes now transformed into a FIBROUS CARTILAGE, characterized by true cartilage cells. This is the second stage of the formation. The cartilage cells appear isolated in the fibrous primordial mass, and without connection with it. They are of different sizes, round, or slightly oval, darker than their surroundings, have coarsely granular contents, a middle-sized, coarsely granular nucleus, but no distinct nucleolus. As they increase in number, the fundamental substance at the same time loses its fibrous texture, and becomes more uniform. In the third stage of development of the cement germ, the OSSIFICATION of the fibrous cartilage commences soon after the appearance of the cartilage cells; a deposition of calcareous masses is seen in the intercellular substance; as the earthy deposition increases, the cartilage cells are pressed together, become smaller, and are at last transformed into bone-corpuscles. This conversion I will not longer dwell upon here, as it will be more closely examined in the following part of this communication. I will only call attention to the formation of the medullary or Haversian canals, which already begins in the primordial germ, as soon as the cartilage cells ap-

pear, or perhaps a little later; the substance of the cartilage liquefies to the required extent, according to the direction of the blood-vessels.

"I have already, in my memoir on the teeth, hinted the supposition that possibly also the formation of the cartilage of bones was effected in a corresponding manner, and I can now perfectly confirm this for a pathological formation of cartilage—namely, for the so-called enchondroma of Johann Müller. . . ."—(*British and For. Medico-Chir. Rev.*)

"*False Anchylosis of the Lower Jaw, of some twenty-four years' standing; relieved by free internal incision, and subsequent continued motion, active and passive.* By WILLIAM CANNIFFE, M.D., M.R.C.S. Eng., formerly Acting Assistant-Surgeon to Her Majesty's forces; late Professor of Surgery, University Victoria College, Toronto.—Immobility of the lower jaw is said to be an affection peculiar to America, and has been attributed to the free use of mercury, which was so fashionable some years ago. The profuse salivation, ending in ulceration of the cheek internally, finally resulted in rigidity of the parts, especially the masseter muscle, whereby the jaw was permanently closed. That the disease is not known in Europe, seems to be substantiated by the fact that no mention is made of it by English writers at least.* That it is due to salivation, seems to be corroborated by the case we purpose to relate. Dr. Mott, of New York, was the first writer to treat particularly of the disease, and to perform an operation for its relief. His first case is recorded in the *American Journal* for November, 1829. When a student in New York in 1853, I saw Dr. Mott perform the operation by introducing a narrow bistoury by the mouth and dividing the masseter muscle, and then with a screw and lever he forcibly opened the mouth. The result was satisfactory. The case I am about to give, it will be seen, was something more than simply a rigidity of the masseter muscle.

"Miss P. consulted me last fall respecting her face, which was to her a source of great annoyance and pain. The account given by herself was as follows: When about two years and a half old, she chanced to get hold of a box of mercury pills, a number of which she ate. The same day she accidentally fell into a drain, getting herself quite wet; the following morning her face was swollen and sore. In a few days ulceration commenced on the inner surface of the left cheek. This gradually extended until the whole thickness of the cheek was involved, and finally, in about ten weeks from the time she swallowed the pills, a large portion of the cheek fell off, (no doubt a gangrenous portion which had just become detached,) leaving a space the size of a penny piece. The mouth remained intact. The healing rapidly progressed, and soon closed up the space in the cheek, but at the same time completely locked the jaw. From that time to the present, some twenty-four years, the mouth has been firmly shut; so closely indeed that once she got a pin between the teeth into the mouth, and had great difficulty to get it out. And she has a horrid remembrance of Christmas-day, when twelve years, having two of her teeth come out in her mouth, which she held there all day, and which she only at night determined to swallow, lest they might choke her while asleep. When nearly five years old an operation was attempted to secure

* A case of this disorder is recorded in the *Lancet* of July 22d, 1865. Reference is also made to other cases in Europe; and it is obvious that the disease may occur in any part of the world.—Z.

mobility of the jaw. She says the soft parts were thoroughly divided from the jaw-bones, but the object was not accomplished. Again, when about fifteen, the operation was repeated by another surgeon, which also failed. Five years ago the face became swollen, and an abscess formed in the left cheek anterior to the cicatrix. This opened inside the lip at the left corner of the mouth; the part again healed. Last August an abscess again formed in the cheek, which opened upon the surface in the site of the original cicatrix. Since that time the cheek has never been quite free from swelling, also there has been an occasional collection of pus. It is this continued discharge which has led her to consult me.

"Upon examination, I find the left cheek somewhat swollen and very considerably widened, so that the mouth is turned to the right side to the extent of nearly an inch. The formation and healing of the abscesses have, no doubt, contributed to produce it. The jaws are most firmly closed. She says, however, that there is a very limited lateral motion of the jaw on the right side. The upper front teeth are somewhat projecting. Thereby it was that a certain quantity of solid food could be introduced to the mouth. The cavity of the left cheek is entirely obliterated up to the very corner of the mouth. Notwithstanding the immobility of the jaw, she could articulate with perfect distinctness.

"I recommended another effort to divide the parts as offering the most probable permanent relief. After some days' consideration she determined to submit again to the use of the knife. The operation was performed on the 24th of October, 1864. I was ably assisted by Dr. Burdett and Dr. Relyea, dentist, whose advice had mainly caused her to undergo the operation. Chloroform was administered. It would be more agreeable to relate that the operation was completed at this time. But unexpected difficulties were encountered. The fact that she could even slightly move the jaw laterally had led me to think that the knife could readily divide all the structures holding the parts together; but, after thoroughly separating the parts, including the masseter muscle, no available force could be found to part the jaws. The reason soon became apparent. They were firmly united by fibro-cartilaginous bands which gave thickness to the periosteum, and fitted closely around the teeth, and in growing they had assumed a very irregular position in the jaws. At the posterior part there was also a quantity of calcareous matter. The operation, therefore, had so far again failed; but we were not discouraged. A week after the patient willingly allowed us to continue the operation. During this time union had been prevented by the introduction of a tent supplied by Mr. Relyea; with a good assortment of instruments for working around teeth, and a fine metacarpal saw, and the patient placed under chloroform, the operation was resumed. A strong scalpel was first used to divide as much as possible of the strong bands, then the somewhat pointed instruments were employed to sever the substance around and among the teeth. Finally, the saw was made to traverse the space between the jaws, while at the same time leverage was used to separate them. The saw completed the work, and the jaw then readily opened to the extent of nearly an inch. On both occasions the hæmorrhage had been considerable, but no important vessel was divided.

"The operation had proved troublesome, but it was a small thing in comparison with the treatment which subsequently had to be pursued. In undertaking the operation, it was fully understood that subsequent to dividing the cheek from the bones it would be necessary to interpose

something for a long time, until the fresh surface had gradually become skinned over by a membrane, and that if this were not done the parts would reunite and the undertaking prove futile. In addition, it was found necessary to have the jaw opened frequently by mechanical means, at the same time to cause the patient to strive often to open it by muscular action, thereby to call into action certain functions of the muscles which had been so long a time dormant. It was necessary to have something placed between the cheek and the jaws that would be cleanly and unirritating. Having mentioned this to Dr. Relyea, he suggested a plate of vulcanized rubber. So, having prepared a model for him, he supplied me with what proved to be a valuable agent. It was an oval concave-convex plate of a quarter of an inch thickness. The introduction of this caused considerable pain; but it was far more comfortable than the tents previously in use. After a few weeks this could be taken out and replaced without any great trouble or discomfort. To maintain, and, if possible, increase the motion of the jaw, the patient was instructed to insert wedges of wood daily, and to gradually increase their thickness, to occasionally use a lever, and incessantly, in her waking hours, to exercise the muscles in opening the jaw. The inflammation from the first was controlled by the application of cold water. The discharge was for some time considerable, and consisted of pus, the *debris* of the cartilaginous structure and calcareous matter. After a few weeks some of the alveolar process came away and even a small portion of the lower jaw. For five months the use of the plate was continued, but its form and size had occasionally to be modified. Gradually the cavity assumed the appearance like unto nature. The tendency to heal by adhesion was strong, and the contractions would, to a great extent, force out the plate. During the last month, indeed, it could hardly be resisted. The ultimate object kept in view was to secure a space in the cheek sufficiently extensive to allow the jaw to be opened to the fullest extent. But the work was cut short by an attack of erysipelas commencing in the part and extending over the face and to the scalp. The plate had to be removed, and when the inflammation had subsided, and the interior cheek could be examined, it was found that where a covering had not yet formed, union had taken place. Fortunately, however, a sufficient cavity had been secured to allow the jaw to be opened rather more than an inch. During the past fortnight the mobility has somewhat increased. The result now is a complete removal of external deformity, the mouth being no longer turned to one side, and the cheek presenting a natural appearance. The patient can eat with comfort, and, what she prizes very highly, can clean her teeth within the mouth, a luxury to her before unknown. Also, she can speak far more fluently."—(*Canada Med. Jour. and Dublin Med. Press.*)

"*Chronic Idiopathic Glossitis.* By JOHN RICHARD WARDELL, M.D., M.R.C.P., Physician to the Tunbridge Wells Infirmary.—The above named is one of those rare forms of disease which are so uncommon as to constitute mere exceptions in the long catalogue of ailments with which the physician has to deal, and of which those of the largest experience, even during a lifetime, observe but few examples. I do not mean those partial and superficial instances where one or both sides are inflamed, without the voice or taste being interfered with, or without the functions of respiration and deglutition being affected, as such are com-

mon enough, and are generally referable to some not very occult cause; but I mean when the major part, or the entire organ, becomes large, tumid, hard, and painful; when neighboring textures become implicated, and when these morbid conditions are persistent, nor readily amenable to treatment. In all such cases the diagnosis is difficult, for whenever the tongue becomes, without assignable cause, gradually large and indurated, it is expedient to give a guarded prognosis. We know that such a state of this organ is ominous, that it is a frequent forerunner of malignant disease.

"M. W——, aged fifty-five, married, had six children, a tall and powerfully-made woman, the wife of a farm-servant, residing at a distance. Stated that until the supervention of this affection she had always enjoyed excellent health. Countenance haggard, dusky, and cachectic. No syphilitic history, nor any suspicion of that disease having ever been contracted. In June, 1862, she began to have pain and a sense of weight and fullness at the epigastrium, which were attributed to indigestion. The appetite began to fail, the general health to be undermined, and she gradually lost flesh. Under these circumstances she was recommended to seek further advice, and with this view she presented herself at the Tunbridge Wells Infirmary, and became an out-patient in the latter part of July following, when the pains in her tongue and throat were, in her own words, 'shooting, burning pains.' During the subsequent sixteen months she was under the physicians of that institution, (which was prior to myself being attached to it,) and these gentlemen tried a variety of remedies without much relief. Both regarded the case as one of malignant character, and feared a fatal termination, which from a review of all the appearances was a reasonable prognosis. This unfavorable opinion being made known to her, and fancying the organ to be still increasing, she was recommended to consult myself. I first saw her Nov. 10th, 1863. She was then emaciated; looked most desponding; spoke thick and imperfectly, as if something were in her mouth; said she had lost two stones of flesh; could swallow nothing but liquids, and dreaded death by starvation. On protrusion of the organ it was large, as if filling the mouth, pale, dry, convex, smooth, and tense, without fissure or raphé, and appearing as if divested of papillæ, even the V-shaped circumvallate lines being obliterated; sides and tip not notched, red and irregular as often noticed, and there was a lack of the ordinary secretion in the entire buccal cavity. On taking the organ between my fingers it felt of cartilaginous hardness, and moderate pressure gave lancinating pain, which radiated into the throat and neck. No ulceration nor any marked amount of injection either in the tonsils, isthmus faucium, pharynx, uvula, or other parts. Submaxillary glands larger than normal, and decided tenderness when moderate pressure was applied to the parotids. On a general examination of the patient, no other signs of disease. Reviewing all the facts of the case and the accompanying symptoms, I was most inclined to coincide with the opinion which had been given—viz., that it was probably malignant. There was, however, the possibility of its being a deposition of lymph, which as an inflammatory product had not been absorbed; and, knowing how the iodide of potassium promotes absorption, I ordered two grains of that medicine with ten minims of compound tincture of iodine three times a day; to live on new milk, eggs, cocoa, pounded beef or mutton made into thick soup, farinaceous food, and a moderate allowance of port wine, all of which, she said, would be pro-

cured for her; vegetables, cheese, bacon, salt meats, and other indigestible articles being strictly prohibited. She came to see me again in the middle of December; I was then from home, but she left a message saying she was decidedly better. I next saw her Jan. 14th, 1864, when at a glance the change in her appearance was most apparent. The tongue was considerably smaller, softer, and the *raphé* faintly discernible. She could swallow solids, had made flesh, and there was less pain in the tongue and throat. The next time she visited me was March 1st, when she had gained a stone in weight, and in every respect there was still greater improvement. The tongue was almost reduced to its natural size, fissure and the papillæ perceptible, and the organ had lost its preternatural fleshy cleanness, and was covered with a thin creamy coat. When examined between the fingers only a small amount of hardness remained, and the enlargement of the submaxillary and parotid glands had subsided. Knowing that Dr. Milner Bury (under whose care she had been previous to his retirement from the Infirmary) took a deep interest in the case, I informed him of her having come to see me. He examined the organ, and was equally with myself surprised at the result. Medicine continued. I saw her Oct. 18, when the tongue was quite natural. She had gained two stones of flesh, and was in her wonted good health. At this date is quite well.

"I will now contrast with the foregoing an example of chronic glossitis which, in greater or less degree of severity, is not uncommon, and which in hospital and dispensary practice is often observed.

"J. F——, aged thirty-seven, of *nervo-biliary* temperament, married, a shoemaker, volume of flesh good, and who to all external appearance was in ordinary health. I first saw him as an out-patient on May 27th, 1864. During the previous eighteen months he had been under medical treatment. No disease of any of the organs in the thoracic and abdominal cavities, with the exception of some tenderness on palpation at the epigastrium, which was full, rounded and resonant. Had syphilis sixteen years ago, but not since. Of temperate habits; and, for a person whose employment is so sedentary, had enjoyed tolerably good health. His complaint was a chronically inflamed tongue. On its protrusion it looked broad, flabby, raw, red, smooth, and shining. No irritation from decayed or roughened teeth.* The papillæ were abolished; redness at the tip and edges excessive; sides irregularly notched and knotty, and at these parts, more especially toward its base, small vascular prominences, like injected excrescent growths, were observable. The organ felt soft and flaccid, and the pain described was that of intense soreness, and not sharp, shooting pains. Pharynx, soft pillars of the fauces, and uvula arborescently vascular; mastication accompanied with some dysphagia, and buccal cavity well supplied with normal secretion. Conceiving this to be a case mainly, if not wholly, depending upon gastric irritation, his diet was minutely particularized. New milk, eggs, cocoa, pounded mutton, soft-boiled rice, and the various farinaceous foods were allowed; smoking, stimulants, and all indigestible aliments to be rigidly discontinued. Three grains of iodide of potassium and ten minims of compound tincture of iodine three times a day; compound rhubarb pill as occasion might require. Under this treatment he made rapid improvement; the organ became narrower, the papillæ more elevated, the beefy appearance less marked, and the lat-

* This, a cause of inflammation and ulceration of the tongue, was noticed by Celsus.

eral prominences much smaller. When he last presented himself he said his 'tongue was wonderfully better;' and after August 12th he did not think it needful to continue his visits.

"When the anatomical structure of the tongue is considered—that it is entirely muscular, and very abundantly supplied with nervous filaments—it is not surprising that it so seldom assumes the phlogistic form of inflammation to which so many other organs and tissues are prone. The best authorities on this subject—such as Frank, Hildebrand, Loefer, Ziegler, Von Mertens, Louis, Travers, Elliotson, and others—have been able to describe the phenomena on but very scanty data. Each of these authors had seen exceedingly few illustrations of the disease, and all remark upon its extreme rarity. In the majority of instances the cause has been assigned to symptomatic disease of the villous coat of the digestive canal, more especially to that of the stomach and duodenum. The more sudden or acute glossitis has been ascribed to the abrupt suppression of the catamenia, hæmorrhoids, and epistaxis. I remember a case which occurred several years ago that was referable to cold rather than any other cause. In that instance the tumefaction came on in a couple of days, with the usual pyrexial accompaniments of quick pulse, hot skin, diminished excretions, and the general febrile expression. Scheidemantal attributes an attack to cold; and Neglian saw an example in a man of forty which was induced by wading up to the waist in water when draining a river. Sudden and serious swelling may supervene from a variety of obvious causes, as irritant and acrid poisons, mechanical injuries, and the stings of insects; and such enlargement may be so great and obstructive as not only to compel respiration to be performed by the nostrils, but to absolutely endanger life by suffocation. Under the now discarded but formerly excessive use of mercury, this fearfully tumid state was wont to occur; and in the writings of Slegel and Trincavellius illustrations are given of this one of the many dire results eventuating from the abuse of that remedy. But its enlargement from this cause partakes more of simple tumefaction than absolute glossitis.

"In the various forms of malignant and eruptive fevers an asthenic inflammation of the organ sometimes occurs, when it becomes large, dark, dry, and fissured; and this inflammation, which is of the diffusive type, is by far most generally simultaneous with the inflammation of neighboring organs, as the tonsils, the pharynx, the parotids. Van Swieten, Reil, and Delamalle long ago described this condition as the complication of grave types of fever. So far as my own experience goes, I would say that it is most frequently seen in typhus and typhoid fevers, and in scarlatina more than in any of the other exanthems. In the asthenic types of cynanche tonsillitis, the basic part will, by contiguity of structure, become inflamed; but its recession is coincident with the decline of the disease in the organs primarily affected. Again, it has been known to become quickly and immensely distended with blood, so as to be rendered large, hard, stiff, and immobile; and such condition Salter has termed *erectile glossitis*. Liston had under his care a patient whose tongue was the seat of a benignant hypertrophy, occasioned by a nævus-like structure which it had assumed. In idiopathic glossitis, it is the thick part of the tongue, its basic third, which is most liable to disease. In several instances only one side has been inflamed. Graves gives an apt example. He was called to see a gentleman who had had febrile symptoms of a week's continuance. The left half of the tongue became painful and tender, and

increased in size : and when he first saw it, it was so swollen as to prevent the proper closure of the mouth. The right half was perfectly natural, and the diseased and healthy sides were demarkated by the meridian line ; articulation and deglutition were seriously interfered with, until the local obstruction of blood produced detumescence ; and two years subsequently the inflamed side was perceptibly larger. Sometimes, however, the swelling is transverse, occupying the base. Travers saw a case in which the enlargement was rounded and globular, chiefly at the dorsum and toward the base. In acute glossitis, the symptoms are always ushered in with heat of surface, quickened circulation, often profuse flow of saliva, and generally diminished taste, the latter of which is doubtless produced by augmented vascularity, because we know that hyperæmia in other organs will, by pressing unduly upon the nervous fibrillæ proper to such organs, prevent the due performance of their motor and sensific functions ; there are also turgid features, tumefactions about the throat, and pains beneath the maxilla. The declension of these symptoms is marked by diaphoresis, hypostatic urine, and a lowered circulation. The case to which I have made a passing reference as resulting from cold exhibited this mode of advent and decline. An antiphlogistic and mild alterative treatment was only indicated, and in the course of ten days the disease had disappeared. Ricord has described a chronic furuncular disease, which first increases notably the volume of the tongue, and then, by pressure and absorption, ends in destructive ulceration ; and these furuncular nodules consist of the circumscribed interstitial effusion of lymph. The history and concomitant symptoms would guard us in our diagnosis, and in all such instances there will often be at the median line true syphilitic rhagades. In scrofulous persons glossitis has been attended with abscess, and generally the matter forms only at one side. Ebermager and Copeland saw this condition as a sequel to its acute form.

"I have remarked in the record of the first illustration above given, that there were cogent reasons for the supposition of the affection being malignant—because the patient looked cachectic, had lost flesh, the disease had come on gradually, and had long continued, (for cancer is generally preceded by slow and insidious symptoms,) because the induration was of scirrhus hardness, and because there were glandular swelling and lancinating pains. On the other hand, there were negative facts which conferred some doubt as to its carcinomatous character. Cancer mostly commences in a small knotty tumor midway between the raphé and the edge of the anterior third ; in an excrescence, often ulcerated, and at the border in one or more tubercular eminences, which tend to break up into ulceration ; lastly, numerical facts attest that males are far more apt to have this disease than females. Some of the writers above quoted maintain that chronic glossitis will, if the induration be not dispersed, have a tendency to degenerate into carcinoma. This doctrine is not, however, by a parity of reasoning tenable ; for without the diathetic proclivity I do not believe that the mere deposition of lymph would ever engender malignancy ; there must be that accompanying dyscrasia by which a flagrant cell-growth is fostered. Rokitsansky has made the remark, which practical pathologists will confirm, that primary cancerous disease is very rarely seen in any of the muscles of animal life, except the tongue. It is quite true that the muscular tissue is often involved, as, for instance, in the pectoral ; but such is only in a *secondary* manner, if in advanced pathology that expression be now allowed. There is a potentiality in

the blastema to reproduce cell-structure in contiguous organs. A blastematous exudate impregnated with the molecular germs of this affection is capable of transference by lymphatic absorption, and doubtless also by venous radicles; and, being deposited in a suitable nidus, such germs become developed into a growth of the same specific character as the primary heterologous product by which they were generated, and from which they were carried. Again, we know that transference can be accomplished otherwise than by lymphatic absorption—viz., by being borne along a mucous membrane in the current of its ordinary secretion. Thus it has been that cancerous germs have in carcinoma of the bowel become implanted to germinate in the rectum, of the kidney in the bladder, and of the lungs in the bronchi. Recurring to the case in question, it is so far practically instructive that appearances very closely resembling scirrhus may present themselves, and yet the disease be benignant, and the effused product capable of absorption. I am of opinion that in this instance a bland, non-irritating aliment had very much to do with the successful issue of the case. The upper parts of the primæ viæ were rendered more quiescent and normal in their functions by the arrestment of that irritation which indigestible articles of food had conferred; because the juvenia seemed to prove this; because the patient very distinctly stated that in the course of a few days after being under my treatment the pains in the tongue and throat in a marked manner began to subside; and because I am very doubtful that the iodine could in so brief a space engender this change. That it contributed potently to the absorption of the lymphic deposit, every impartial judgment will allow; but the nourishing, easily assimilated ingesta were, I think, the greater factors in the benefit. With regard to the second example, the strict rules enforced respecting the diet constituted the most essential part of the treatment, as that form of glossitis is entirely dependent upon protracted irritation of the mucous surface of the digestive canal.”—(*Lancet*.)

“Cure of Ulceration of the Tongue which had existed for Twenty Years. By ARTHUR LEARED, M.D., M.R.I.A., Senior Physician to the Great Northern Hospital.—A gentleman sixty-two years of age consulted me last April for a very troublesome sore mouth, as he termed it himself. He came to me under the impression that the affection was caused by indigestion, but his healthy ruddy appearance and the absence of all gastric symptoms prevented my adopting this view. I found the middle of the dorsum of the tongue occupied by a sloughy oval-shaped ulcer, the long diameter of which was that of a shilling. The inside of the mouth and margins of the lips were studded with white aphthous-looking patches, surrounded by deep-red mucous membrane. These sores were a perpetual source of annoyance in eating, and of severe pain if spices or anything of higher temperature than usual was taken. The ulcer on the tongue had existed during the long period of twenty years, and even its shape and appearance had undergone little alteration. But the minor ulcerations, after remaining for some time, would gradually subside. They seemed also to shift from place to place, and sometimes would almost entirely disappear. The patient had had a primary syphilitic sore thirty years before, followed soon after its healing by a secondary eruption, for which he was treated in both instances by a surgeon of great eminence. He has since repeatedly consulted this gentleman about his mouth, but no measures were ever taken except the local application of caustic and of washes.

"Partly influenced by the apparent non-syphilitic view of the case, I prescribed chlorate of potash in full doses, with a strong solution of the same for local application. This treatment was persisted in for more than a month without benefit. I now resolved to try the effect of more active agents. Four minims of Fowler's solution of arsenic were ordered to be taken three times a day, and a mercurial bath twice a week; the ulcer of the tongue to be touched daily with nitrate of copper. This treatment was continued for twenty-five days, the dose of arsenical solution having been increased to five minims. It was noted that after the first week the tongue had slightly improved, but further improvement, if any, was very trifling. The baths seemed to have caused a troublesome eruption between the shoulders. Donovan's solution of arsenic, iodine, and mercury was now given in doses of twenty minims twice a day.

"On the fourth day of this treatment I had the satisfaction to find that the ulcer on the tongue had broken up into two patches, leaving a sound intervening portion between them. As the medicine purged, a pill containing half a grain of opium was directed to be taken after each dose.

"On the tenth day the largest of the ulcers on the tongue was about the size of a split pea. The patient's feet had now become so sore that he could walk only with difficulty; there was a decided inflammatory blush round the heels and balls of the great toes, which were also very tender.

"On the twenty-sixth day the tongue had healed, except in a mere point; but the feet were very sore, red, and desquamating; the palms of the hands were also becoming affected. He complained also of an aching in the back of the gums. The dose of the medicine was therefore reduced to one-half. Two days later the tongue and mouth were quite sound, with the exception of some aching in the gums. The medicine was persevered in for some time longer in diminished doses, during which the affection of the extremities gradually disappeared.

"About five months after the healing of the ulcer, copper-colored scaly patches appeared on the lower extremities. These yielded slowly to iodide of potassium with mercurial baths. He is now quite well, and the tongue and mouth have continued sound.

"*Remarks.*—The persistence of an ulcer on so vascular an organ as the tongue for twenty years is of itself remarkable; but its cure illustrates in a signal manner the power of medicine. The most inveterate skeptic could hardly maintain that the cure had been spontaneous, and that the medicines coincidentally taken had been simply inert. Such a case is an answer to those who deny the efficacy of drugs—a thing, let me add, only denied by those who have never given their minds to the study of therapeutics. The employment of arsenic and mercury together was suggested by a natural anxiety to benefit the patient as speedily as possible; but, in reference to the determination of the separate action of the remedies, would have been better avoided. The skin eruption proved the syphilitic nature of the case, and it is an interesting circumstance that the ulcer seems to have acted as a derivative, since there was no eruption while it existed. Mercury was probably the most effective agent; but there is no reason for supposing that in certain cases of syphilis arsenic is not also highly useful. Experience convinces me of the greater utility of these powerful drugs in some chronic cases than either of them separately. Inflammation of the feet and hands is a singular effect of arsenic,

only glanced at in works on therapeutics. Another well-marked instance of it occurred to me some time since in the case of a gentleman, for whom I successfully prescribed Fowler's solution in increasing doses for a refractory form of eczema. His feet were as red and swollen, and walking as much interfered with, as if he suffered from a severe attack of gout."—(*Ibid.*)

Adventitious Odontogeny.—In the report of the proceedings of the Obstetrical Society of London (*Lancet*) it is stated that "DR. TYLER SMITH exhibited a portion of a dermoid cyst, with teeth attached, passed per rectum from a lady who had for a year and a half previously evacuated by the same canal a quantity of hair."

"Cystic Tumor of the Antrum of Highmore. Surgical clinic by PROF. GROSS, reported by William T. Bullock, M.D., of Rhode Island.—S. S., thirty-nine years of age. This man has a tumor of five months' growth on the left side of his face, in the situation of the antrum of Highmore. By placing a finger inside of the mouth, and another upon the outside of the tumor, and making alternate pressure, distinct fluctuation may be produced, giving also a parchment-like feel to the fingers. That this is not a malignant growth is shown by its long duration, with the absence of pain and ulceration.

"June 28. An incision being made into the tumor by cutting through the mucous membrane of the mouth, just above the alveolar processes, the contents escape, consisting of about three ounces of fluid, containing shining particles resembling cholesterine. This is a cystic tumor of the antrum, produced by the occlusion of its natural outlet.

"The secreting membrane lining the cavity has continued the exercise of its functions, and the fluid thus formed, pressing upon the surrounding walls, has distended them greatly, and reduced them to the thinness of parchment, the osseous matter being absorbed, and a fibro-cartilaginous substance taking its place. Fortunately, in this case the outer wall has been the first to yield, so that the eye has not been encroached upon.

"If the opening by which the cyst has been evacuated is allowed to close, there will be a return of the tumor, as it is not possible to reopen the natural duct of the antrum. Hence it will be necessary to introduce a tent into the opening made by the knife, and syringe out the cavity occasionally with water, followed at the expiration of a few days by injections of a dilute solution of chlorinated soda, in order to change the nature of the lining membrane, and allow the cyst to become obliterated by the contraction of its walls."—(*Med. and Surg. Reporter.*)

"Epithelioma.—Pat D., sixty years of age. The tumor is situated on the edge of the lower lip, a little to the right of the medial line. It is of three months' duration. The base of the growth is indurated, and its surface ulcerated at several points, from which there is a slight discharge of a fetid character. The gum is sound, but toothless, and the frænum is free from disease, but the lymphatic glands at the base of the jaw are slightly indurated. This disease is called epithelioma, though it is really nothing more than scirrhus, its appearance being modified by the nature of the part affected. Death usually occurs in this affection, from nine to eighteen months from its commencement. A V-shaped portion of the lip, including the diseased structure, is removed, and the parts nicely adjusted by the twisted suture.

"May 10th. P. D., the patient operated upon a week ago to-day, presents himself this morning, with the wound made by the knife entirely closed, and with but little deformity of the mouth, although a large portion of the lower lip was removed in the operation. The pins, which were introduced in making the twisted suture, were removed on the third day from the operation."—(*Ibid.*) —

"Fibrous Tumor of the Arch of the Palate.—John T., eight years of age, presents himself on account of a tumor of the arch of the palate, on the right side of the uvula, a remarkable situation for a growth of this kind. Hanging down into the fauces, it is of a grayish color, and interferes considerably with respiration and deglutition, and the voice is muffled.

"It has increased in size quite rapidly since it was first noticed, two months ago. Judging from its feel, it is probably of fibrous nature, but whether of a benign or malignant character, is uncertain.

"It would be an easy matter to excise this tumor, but it is evident from its rapid growth that it must be very vascular, and might give rise to troublesome hæmorrhage, if removed in this way. A silver wire, passed through a double canula, was therefore placed around the base of the tumor, and twisted tightly by turning the instrument on its axis. The tumor, thus separated from its attachments, was drawn from the mouth.

"No hæmorrhage followed. The lad returned in a week, perfectly well. A microscopic examination proved the morbid growth to be of a strictly fibrous structure. It had doubtless existed a considerable time before it attracted any attention."—(*Ibid.*) —

"Colloid Enchondroma in the Parotid Region. (Under the care of Mr. HULKE, Middlesex Hospital.)—In common with the other glands connected with the buccal mucous membrane, the parotid is often the seat of cartilaginous tumors. These probably arise in the interfollicular connective tissue, and not in the intrinsic tissues of the gland. The corpuscular and intercorpuscular elements of the cartilage vary remarkably in figure and consistence in different tumors, and even in different parts of the same tumor.

"A thin, middle-aged woman was admitted into Bird Ward on March 22 with a prominent oval tumor in the right parotid region of the size of a hen's egg. Its surface was tuberos. In parts it felt solid, while in other parts it had all the elasticity of fluctuation. It reached from the angle of the jaw to the zygoma, and from the anterior border of the masseter to the ear. It could be slid up and down, but not be moved from before backward. The skin was free, and the movements of the jaw were little hampered. An enchondromatous tumor, originating superficially in the parotid, was diagnosed.

"The tumor was dissected out with very little hæmorrhage. Some large branches of the portio dura were turned aside and saved. For a few days she was troubled with spasms in the cheek. An attack of erysipelas retarded her recovery. She left the hospital on April 3, convalescent.

"The tumor exhibited in different parts every gradation, from firm, translucent white to soft, transparent, colloid cartilage. The latter kind predominated. Histologically it consisted of an abundant structureless matrix intersected by stiff fibres and numerous branched cells resembling

connective tissue corpuscles. In the firmer portions round and roundly oval cells multiplying by fission of nucleus predominated."—(*Med. Times and Gaz.*)

"Myxoma in Cheek. (Under the care of MR. HULKE.)—The small glands beneath the buccal mucous membrane are not unfrequently the seat of new growths. These are sometimes fibrous, often cartilaginous, and less frequently consist, as in the present instance, of a soft web of connective tissue web, filled with mucine. In this respect the myxomata differ from other tumors of glandular origin in which mucine is lodged in follicles. The glands beneath the mucous membrane lining the lips are perhaps more often diseased than those at other parts of the buccal membrane, and the tumors originating in them, sometimes reaching the size of an almond, are often flattened by compression against the jaws, while those in the cheeks are frequently globular.

"The patient, a girl aged eight years, had a firm, globular, painless knot, of the size of a marble, in her left cheek, opposite the second lower molar tooth, immediately under the buccal mucous membrane; the skin was movable on it. It was dissected out through the mouth. On the second day there was severe hæmorrhage, probably from the facial artery. It was stopped by ice and pressure, and did not recur. The wound suppurated and cicatrized in ten days.

"The minute structure of the tumor showed a web of branched cells, the meshes of which were filled with a clear viscid mucus."—(*Ibid.*)

"Relief in Cancer.—DR. BRANDINI, of Florence, has recently discovered that citric acid will assuage the violent pain which is the usual concomitant of cancer. One of his patients, aged seventy-one, at the Hospital of Santa Maria della Scala, was afflicted with cancer on the tongue. There was no possibility of performing an operation, the surface attacked being far too extensive, investing the base, the sublingual, and the sub-maxillary glands. The poor man in the midst of his torments asked for a lemon, which was nothing very remarkable, as cancerous patients generally have an extraordinary liking for acids. But the seat of the disorder being in the mouth, a circumstance was observed which might otherwise have escaped attention: the juice of the lemon diminished the pain."—(*Ibid.*)

"Extraction of Nineteen Teeth under Chloroform. By MR. A. AARONSON, L.R.C.S.E.—This operation, with the aid of the above agent, I successfully performed at my house on the 29th of June last. The patient was a lady, aged twenty-four, residing at Newbury. The cause for the removal of the teeth was caries, as deep as the cementum, of nearly every tooth, causing severe neuralgic pains in the cold seasons. The time occupied in the extraction of the teeth and plugging the cavities, after the removal of each tooth, to suppress the hæmorrhage, was thirty-five minutes. The chloroform was administered by Mr. V. Dukes, Surgeon. Of the upper jaw I extracted four molars, three bicuspid, and six front teeth, leaving one wisdom tooth. The patient had never had the fourth bicuspid, and the second wisdom tooth has not yet made its appearance. Of the lower I extracted four molars, one bicuspid, and one canine, leaving four front, one canine, and one bicuspid. Several of the teeth had been previously stopped. All of them were short, with long fangs; the

front teeth, upper and lower, never touched each other, and the bite being very close at the back, the upper molars ground into those of the lower, like pestle and mortar. With the aid of astringents, the gums were well enough to have artificial teeth fixed on August 1, and the patient has returned to the country, relieved of all pain and all the ills arising from defective teeth.”—(*Ibid.*)

Electrolysis in Surgery.—“M. SCOUTTETEN, in a memoir read at the Academy of Medicine upon the application of electrolysis in surgery, observes that Faraday first used the term to distinguish the decomposing action of electricity from analysis obtained by purely chemical procedures. He gives an account of eighteen operations which he has performed by its aid, and concludes as follows: The effects of electricity are of three kinds—1. Electrolyzation, that is, decomposition of the elements of the tissues without disorganization; 2. Accumulation of acids and alkalies at each pole, *i.e.* chemical cauterization or disorganization of the tissues by these bodies; 3. Physical cauterization, produced by the caloric developed by a galvanic current passing through a homogeneous metallic thread. These two latter actions are secondary effects of electricity, which may be replaced by other agents, as caustic alkalies or the actual cautery. 4. The electrolytic method is perfectly applicable to all soft tumors containing decomposable liquids, the cysts of the wrist, hydrocele, liquids within or around the joints, soft ganglions of the neck, soft goitre, arterial or venous tumors, and perhaps ovarian cysts. It should be rejected in the treatment of cancer, and fibrous or indurated tumors, unless of a very small size, and destructible by slight cauterization. Neither is it suitable for the treatment of lipoma, and all non-encysted tumors in which the fatty element prevails.”—(*Ibid.*)

“New Anæsthetics.—MR. NUNNELEY showed to the members of the British Medical Association two substances, the bromide of ethyl and the chloride of olefant gas, which for some time past he had used as anæsthetics. He stated that he had not lately performed any serious operation, either in private practice or at the Leeds General Infirmary, without the patient being rendered insensible by one or other of these agents; each of which he believed to possess important advantages over chloroform. They were among the many analogous bodies experimented upon by him, and were favorably mentioned in his essay upon Anæsthesia, which was published in the *Transactions* of the Association for 1849. At that time the difficulty and cost of their manufacture were too great to allow of their being commonly used. This difficulty had, however, been overcome; and, should their use become general, they can be made at a cost not exceeding that of chloroform, if not at less. They both act speedily, pleasantly, and well. The patient might be kept insensible for any length of time, while the most painful and prolonged operations were being performed. No disagreeable symptoms had in any case resulted from their use.”—(*Chem. News.*)

“Armenian or Diamond Cement.—This article, so much esteemed for uniting pieces of broken glass, for repairing precious stones, and for cementing them to watch-cases and other ornaments, is made by soaking isinglass in water until it becomes quite soft, and then mixing it with spirit in which a little gum mastic and ammoniacum have been dissolved.

"The jewelers of Turkey, who are mostly Armenians, have a singular method of ornamenting watch-cases, etc., with diamonds and other precious stones, by simply gluing or cementing them on. The stone is set in silver or gold, and the lower part of the metal made flat, or to correspond with the part to which it is to be fixed; it is then warmed gently, and has the glue applied, which is so very strong that the parts so cemented never separate; this glue, which will strongly unite bits of glass, and even polished steel, and may be applied to a variety of useful purposes, is thus made in Turkey: Dissolve five or six bits of gum mastic, each the size of a large pea, in as much spirits of wine as will suffice to render it liquid; and in another vessel dissolve as much isinglass, previously a little softened in water, (though none of the water must be used,) in French brandy or good rum, as will make a two-ounce vial of very strong glue, adding two small bits of gum albanum, or ammoniacum, which must be rubbed or ground till they are dissolved. Then mix the whole with a sufficient heat. Keep the glue in a vial closely stopped, and, when it is to be used, set the vial in boiling water. Some persons have sold a composition under the name of Armenian cement, in England; but this composition is badly made; it is much too thin, and the quantity of mastic is much too small.

"The following are good proportions: Isinglass, soaked in water and dissolved in spirit, two ounces, (thick;) dissolve in this ten grains of very pale gum ammoniac (in tears) by rubbing them together; then add six large tears of gum mastic, dissolved in the least possible quantity of rectified spirits.

"Isinglass, dissolved in proof spirit, as above, three ounces; bottoms of mastic varnish, (thick but clear,) one and a half ounces; mix well.

"When carefully made, this cement resists moisture, and dries colorless. As usually met with, it is not only of very bad quality, but sold at exorbitant prices."—(*Tinman's Manual and Sci. Amer.*)

Linoleum.—"A new material is manufactured under the name of Linoleum, which is stated to possess many of the valuable qualities of India-rubber. It is prepared by oxydizing linseed oil and then combining it with resins, etc. It is said to admit of vulcanizing."—(*Franklin Inst. Jour.*)

"*Substitute for India-Rubber.* By JAMES HANSCROFT, Cincinnati.—Among the many applications of petroleum I notice one of a very strange character—I refer to the invention of our citizen, Mr. John Root. After a great deal of patience and skill he has really succeeded in making a composition that vies with vulcanized rubber for strength and usefulness, from the solid residuum that remains in the still after the more volatile vapors are driven off the well-oil or petroleum. I have seen some very beautiful picture frames and medallions, equal, in fact, to any manufactured from rubber. He also makes bottles and jars of the same composition. Truly we live in an age of improvement."—(*Sci. Amer.*)

"*Improved Method of Setting Splinters for Diamond Drills.* By GAM'L JACKSON, of Winona, Minn.—Having had occasion to use diamond drills for perforating porcelain, in experimenting toward a new method of restoring defective crowns of natural teeth. I ordered this instrument from a New York lapidary, who informed me that there was always a degree

of uncertainty about the point remaining firm. I experienced this difficulty before I had drilled a single hole with a $\frac{3}{4}$ line drill. I reset this splinter in the following manner: Having prepared the pieces in the usual way, I sunk a triangular recess in the smaller piece, using for this purpose an obtuse drill and an engraver's flat burin. The usual offset was filed in the other half, but with the shoulder cut under with a three-square file, corresponding with the bevel of the splinter. The space was adjusted so that the splinter held the pieces slightly apart. The parts, with the point in place, were next attached with soft solder, and two small holes were drilled through the rod, one about a line from the splinter and the other near the end of the smaller piece. These holes being tapered with a broach, and fitted with soft steel pins, the soft solder was scraped off and the two pieces brought to a spring temper, and then riveted together.

"I have used this drill considerably, and it is perfectly firm. By tempering the setting and riveting together, two important advantages are gained—hardness, with additional tenacity, and tension. These objects are defeated by using silver solder in making drills."—(*Ibid.*)

"*Rouge Powder*, or *Jeweler's Rouge*, of excellent quality, may be prepared as follows: Dissolve sulphate of iron in boiling water, filter, and add a concentrated solution of oxalic acid, as long as a yellow precipitate of oxalate of iron is formed. When the fluid has cooled and all precipitation ceased, the precipitate is collected on a cloth and washed with hot water until the water shows no acid reaction. The oxalate of iron, not yet perfectly dry, is then heated on a plate of iron over a charcoal fire or lamp; at a temperature of about 400° Fah., the decomposition of the salt commences, and at a little higher temperature it will ignite and form a red oxide of iron in a very finely divided state."—(*Am. Drug. Circular.*)

Powdering Gold.—It is stated (*Ibid.*) that "the best plan, probably, for preparing finely divided gold, is to dissolve pure gold in aqua regia, to dilute the solution by water, and to precipitate by oxalic acid."

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The Use of the Laryngoscope in Diseases of the Throat, with an Appendix on Rhinoscopy. By MORELL MACKENZIE, M.D., Lond., M.R.C.S., Physician to the Dispensary for Diseases of the Throat, etc. Philadelphia: Lindsay & Blakiston, 1865.

This work presents a concise history and description, with engravings and directions for the practical application of the laryngoscope. It is somewhat profusely illustrated, and exhibits a very good view of the instrument and its accessories. It gives, in a condensed form, much useful information on laryngoscopy, and is well adapted to meet the wants of the student and practitioner of medicine. Its value is enhanced by the appendix, and the admirable manner in which it is gotten up, with superior paper, fine drawings, elegant print, and handsome binding.

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This standard little manual is issued in the usual neat and substantial style.

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, NOVEMBER, 1865.

No. 4.

ORIGINAL COMMUNICATIONS.

NUTRITION.

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THROUGHOUT the entire life of every being two operations are constantly taking place in the elementary structure of the various portions of the economy, viz.: 1. *Composition*, or the process by which nutritive material becomes assimilated. 2. *Decomposition*, or the action by which death and disintegration of old parts takes place. It is through these two operations, constituting the process or function of *nutrition*, that parts are maintained in the same general conditions of form, size, and composition which they have already by development and growth attained; and this notwithstanding, but rather by means of continual changes in their component particles. It is by this process that an adult person in health is maintained through a series of years, with the same outline of feature, the same size and form, although during all this period the several portions of his body are continually changing, their particles decaying and being removed, and then replaced by the formation of new ones, which, in their turn, also die and pass away. This operation is not confined to particular organs or portions of the body, but takes place in every part of the economy, modified, however, in activity by the age, constitution, state of health of the individual, and relative density of the different tissues, being most active in youth, greatly lessened in old age, and occurring with greater rapidity in vascular than non-vascular tissues. As a general rule, the greater the demand for the functional activity of an organ or tissue the more energetic its nutrition. Bone, cementum, dentine, and enamel being the lowest in the scale of organized substances, the change of course is slow, but nevertheless constant in all of them.

In *growth*, where the form and other general characters are maintained, accompanied by increase of size, the change of component particles is made readily manifest. The *secretions* also give evidence of the *waste*

and *repair* of tissues, for the mucous membrane and the different glands are constantly throwing off cells in the secretions which they give, yet the integrity of all is maintained, for new cells are produced in place of those that are cast off. The same is true of the epidermis, the muscles, the nervous system, and other soft tissues. Among the evidences of molecular change in bones are the formation of the frontal and sphenoidal sinuses in children, the absorption of bone under the pressure of swellings, the absorption of the alveoli of the jaws, and thinning of the cranial bones in old age, etc. The enlargement of the cavities of the bones, with enlargement of the whole bone itself, and indeed the mere growth of so solid a body by interstitial assimilation, and the changes that its form undergoes during it, is not conceivable without a constant removal of osseous particles from certain parts, and the deposition of similar particles at other points, consequently not without a change of material.

The absorption not only of the cementum and dentine of the fangs, but also of the dentine (and in some instances of portions of the enamel) of the crown of deciduous teeth are undeniable evidences of molecular integration and disintegration even in the dental tissues.

Much of this change referred to above is due to the wear and tear incident to use, or to functional activity, but in addition to this every molecule of the body is only formed for a certain period of existence, and when that limit is reached, if not previously destroyed by external force or exercise, it degenerates and is absorbed, or dies and is cast out. Each particular molecule or cell that enters into the composition of an organized structure finds its analogue in the existence of an individual being, for it is born, lives, reproduces its kind, and dies. All organized beings existing on the earth eventually disappear from its surface, and the different races would speedily become extinct but for the beneficent provision of nature by which they reproduce and multiply themselves; our parents are reproduced in us, and we in turn are repeated in our progeny. The individual perishes, but the species is continued. And thus is it with the cells, which indeed are not only the agents in the preservation of the life of the individual in the process of nutrition, but also are the agents in the preservation of the species in the act of fecundation.

The presence of matter in organized beings implies a constant draught on the inorganic kingdom, for an analysis of all organic substances resolves them into the primary elements, but there is a limit to the amount of inorganic matter, and the resources of nature would be speedily exhausted were it not for the fact that an equivalent amount is returned to the source from whence it was obtained. The elements which enter into the composition of our bodies indeed are only borrowed from the earth and surrounding atmosphere, and united together by the operation of the natural *forces*, and then after a brief period this relation is dissolved, and the constituent elements separate to again enter into new

combinations; for matter, whether organic or inorganic, is never destroyed. If it disappears from observation it is only to enter into other relations. A substance may be reduced to powder, melted into a liquid, or by more intense application of heat dilated into a gas and dissipated in vapor, but the *elements* still continue to exist, and in many instances again unite in the same substances without change of form. Thus in organized bodies the *decomposition* which constantly takes place is only a process by which these elements are liberated to assume new combinations and new forms. What life borrows is sooner or later liberated by death. It is this constant absorption from, and return of material to the earth and atmosphere, by organized beings, that keeps up the continuous stream of life and renders the source inexhaustible. Hence the matter which entered into the composition of animals and vegetables in the earliest periods of the world is still in existence, and we are formed of material as old as the creation, and which has served the purposes of beings anterior to, and during our own time, as we in turn, by the constant disintegration of our tissues, yield up the matter of which we are composed to furnish material for new existences.

(To be continued.)

TEACHING.

BY WM. H. ATKINSON, M.D.

(Continued from page 126.)

MAN is a self-conscious being, or, in other words, he is capable of perceiving not only his own individual existence and nature, but also that of every other form of being that comes within the range of his powers of observation. But this is strictly true of him only in his state of full development or complete maturity. It therefore follows that he can only *know* himself in so far as he is ripened in the various departments of his nature. The question whether the ancients were so ripened or not, can only be determined by a correct reading of the history of the human race of that period of the world's existence.

There are three principal states of human existence analogous to the three so-called kingdoms in nature, viz., the mineral, the vegetable, and the animal.

In a general way we may say that merely to be is analogous to the mineral, to do to the vegetable, and to suffer to the animal mode of expression of the dominion of force or life presence.

He who lives without exertion or purpose has the lowest or mineral degree of life predominant in him.

He who acts without definite purpose simply vegetates and enjoys one degree more of refinement of substance and sense.

While he who is constantly enthused with the high purpose to *do good to somebody*, is alone in the way of full development of the germs of life and power that are planted down deep in the very soil of his being. So he that seeks ease, quiet, rest, will be long in maturing any of his powers or capabilities, and he who labors in fitful purposeless spirits will be irregular, gnarly, and angular in his development, never coming to a full and complete ripeness; while he who is lashed into a furor of constant action by the pressure of the ever-present purpose to *do*, will be so warmed, even down to the coldest depth of his nature, that a general growth and ripening of all parts of his being is vouchsafed to him as the sequence of the undying purpose to help some one out of darkness into light. This sort of mind never has time to be jealous or envious of the attainments of others; indeed he is past the need or possibility of such spur to continued effort.

When he sees one of his fellows in the advance of him, as he constantly must and ever will, he takes courage at the sight and comforts himself with the retrospect of what the advanced one himself once was, even lower than he now feels himself to be. So he buckles cheerfully to the work, assured that just as fast as he can prepare himself for advanced views, knowledges, demonstrations, and power, they all eagerly await the opportunity to take up their abode in his consciousness also, and although feeling his deficiencies a load intolerable to be borne, he determines with increased effort to *do* or die in the attempt, and lo, in that auspicious moment, the light of demonstration bursts upon him, and, in the exultant joy of his new-born power of apprehension, he repeats the demonstration to his fellows, thus sealing it forever in his own catalogue of knowledge as a reward for having generously and promptly imparted that for which he had so ardently labored.

That the ancients fulfilled their destiny in the great scale of progression is philosophically certain, but that they had any adequate conceptions of the chemical, anatomical, physiological, and psychical elements of the nature of man is not so certain. In the great onward movement of planetary existence it is very sure that each age must do its own specific work in the fulfillment of the purpose for which it is called into being. And if this be true, as it surely is, of planets, ages, continents, countries, nations, communities, and classes, what must we not conclude respecting the individuals composing all these!

He who never suffers from an oppressive sense of his ignorance is indeed to be pitied, while he who is constantly afflicted with a sense of his shortcomings and lack of knowledge will be sure to be made so uncomfortable in his darkness that he will move heaven and earth with his labors and cries for help, until he is taken from the horrible pit of mire and clay of his mineral state through the budding, blossoming, and fruitage of the vegetable to the freedom of light, and movement of the animal

analogue of his whole nature, in which alone he can find field large enough to employ his improved and improving powers.

Let me propound the question, "What is man?" to each one of you here present. Without the knowledge or concurrence of any other mind, what would be the reply I might rationally expect from each? Beyond all doubt the answers would vary in exact accordance with the knowledge each one had acquired of the constituents and character, as a whole, of the subject of our inquiry.

Amid all the possible replies to this momentous question, one alone is satisfactory to all minds developed to the point necessary to see its aptitude. We might enumerate all the fractional answers conceivable, and still be lost in the volume of their number, unless we had reduced them to one which included all these.

The one answer for all time to this question is, "The personification of all things planetary in one microcosm, or little planet or world." If then it be laid upon us to make an exhaustive analysis of man, does any one doubt that we have work enough laid out to occupy us for the session?

Let us not be appalled at the immensity of the work, and the dullness of prospect that it can ever be accomplished. But let us remember what has been done, and compare what is already reduced to demonstration with the great unknown, and bear it in mind that the time was when the first point or movement was made out of that dark ocean, and illimitable as is the negation of all things, and oppressive as is the contemplation of the paucity of our knowledge as compared to our "not-knowledge," nevertheless a very respectable beginning has been made, of which we are all living witnesses. In proof of which the whole history of the creation of the planet, origin, development, culture, and progress of the various ages and nations might be rehearsed, showing how exactly all things are repeated in type and mode of development in all that comes within the range of our powers of observation in its most gigantic as well as its most minute exercise.

To make our observations of any use to us, and enable us to communicate the doctrine they teach to those who come after us, it becomes necessary that they be coherent and regular, by which arrangement alone they can develop the great plan of life and being in which we all have such immensity of interest, into definite understandable shape, capable of symbolization in signs of definite ideas, the proper groupings of which constitute and develop the plan.

The first useful division of ideas into classes may be said to be sameness and similitude, and if we permit no confusion here there can be no dissension as to what constitutes the great oneness of idea in the minds of all sentient.

But the difficulties that beset our path in our efforts to convey ideas to our fellows, arise from the impossibility of entering that sphere of each

other's mind by other means than similitudes, by which we seek to portray in symbols the idea, which, could we but project it in its own identity, would be sameness, not similiarity.

It will be readily perceived that out of this primary division of ideas all degrees of diversity and similiarity flow as from a common fountain.

Idea means "form," and plan a static condition of idea, singly or compositely. Thus ideas may be incoherent, irregular, and vague; but plan, so long as it holds dominion, is always regular, positive, and persistent.

Ideas being the material of which plans (platforms) are made, are capable of preservation and reconstruction on a new plan when the old has ceased to have function, or has completed the function it was possible for it to subserve. When the correlation of ideas which constitutes the mineral kingdom was the highest manifestation of life presence on earth, the mineral plan held dominion. But so soon as the advent of ideas of higher combination in the vegetable mode of life pronouncement became possible, the mineral plan began to disintegrate, out of whose ideas in new combination was produced the lowest expression of the vegetable plan in fucoid plants. This disintegration of the lowest expression of the mineral plan began at the point in time when its altitude of dominion had been just half accomplished.

So the lowest or first pronounciation of vegetable body marks the exact mean between the lowest and highest crystal known to the mineral kingdom.

In like manner the progression of combination of ideas has produced the four kingdoms which have held successive dominion of the planet, the plan of whose development is of such moment to us.

From the great ocean of chaotic negation of ideas has sprung, in regular succession and disintegration, the mineral, vegetable, animal, and human kingdoms, the latter of which is now near the mean of its pronounciation.

This last statement will account for the impossibility of demonstration of the higher philosophies to the mass of mind, mathematics alone being demonstrable to that degree of development of the human kingdom.

Death, here as everywhere, is the precursor of higher life. Conviction of our deficiencies first, conversion into sufficiency is sure to follow. Dominion does not mean annihilation, it only signifies control, direction, sublimation. As observed, when the mineral plan was the highest expression of life it then held dominion. From this it is easy to understand why any power can hold the dominion of a realm. Because it is capable—has the head, brains, *ideas* in highest correlation and perfection. All proof beyond the pale of self-evident propositions depends upon comparison of the new positions with those already known or agreed upon, but all this, though "clear as a sunbeam," only resolves itself into

the query of "How came we in possession of the points known or agreed to be a verity?" to constitute the standard by which to measure all future mental acquisition.

It requires sight to comprehend the sunbeam—it no less requires mental development to be able to take in and compare one proposition with another. So, if we must go to the very bottom of the matter, we are forced to contemplate the mind in its formative state, and observe its primal act, to do which demands a dissection of the structure that produces mental phenomena when acting or acted upon.

This structure is no less than a sphere composed of six concentric or hollow spheres, one within the other, after the manner of the shuck, shell, and meat (or kernel) of a nut.

Each department is endowed with an inclosing flexible wall, and a proper parenchyma or contents, which is in intimate contact with the outer wall of the next inclosed sphere or compartment in all cases, but the innermost or centric sphere, which is devoid of contents other than its own proper parenchyma—in which the mental act finds culmination and completion in the highest degree constituting demonstration, certainty.

This is the machinery or structure. Now let us see how and why it moves.

An impulse from without impinges upon the outer pellicle or wall, which sets up an undulation whose waves are propagated equally both ways, involving the entire belt or zone encircling the sphere. These waves, being equal divisions of the surface of the globe, of course arrive at the opposite point from that of the advent of the impulse, which caused the waves crest to crest, and not crest to trough, which would at once neutralize the impulse; but crest boldly meets crest, and thus each is repelled with such force as to retrace the course through which they came back again to the point of starting; when they now have involved the whole depth of the parenchymal sea immediately beneath the point of first contact, and they now fuse into a single body, and by reason of the impetus of their projectile movement through the inclosing sea, in contact with the outer wall of the next compartment or plane, set up a like undulation there, to repeat the rôle of action just completed, through the series of spheres until it arrives at the centric sphere, in which it is now resolved again into a perfect form—a spherule—under the denomination of knowledge.

Mental acts are reducible to: 1. Aspiration; 2. Feeling; 3. Idea; 4. Thought; 5. Opinion; 6. Belief; and 7. Knowledge.

Aspiration is resultant upon a sense of lack, need, deficiency, want. Which produces approximation to a vacuum inducing "inspiration." Now that which is inspired is the germ of mental force, which is serially developed upon the law of evolution just delineated into the successive stages of definition of mental product or labor, in the forms of feeling,

idea, thought, opinion, belief, and knowledge, when it rightfully becomes the property of the sentiency which produced it.

Knowledge is complete. Belief is the consent of mind to adopt conclusions upon testimony, and hence is a degree less positive or certain than knowledge.

Opinion is feeling, idea, thought, and plus (+), but still less definite than belief, a mere stage in the process of our "inspiration" becoming a knowledge.

Now all becomings of *unknown* to *known* are positings, divisions, reductions in dimension, not in character, in nature.

It is now clear that the known is naught but the symbol, shade, or likeness of the unknown, too great to be taken into our mental receptacles "in toto;" and hence we must be content to *know* but in part until that perfection of the human kingdom in which "we shall see as we are seen, and know as we are known," shall fully dawn upon those who are prepared to enter into it. The becomings of knowledge are first spontaneous, and second voluntary. Is it not clear that we must have a mind before we can exercise it?

In the nature of things we can only exercise the powers we are conscious of possessing, and hence all volitions are but repetitions of past acts; all new acts are spontaneities and revolutionary in tendency, as instanced in the production of and partial destruction to the three primary kingdoms, "*passim*."

Human minds are all harmonious when under the dominion of feeling, idea, and knowledge, but antagonistic, quarrelsome, irascible, and testy when under the incomplete dominion of thought, opinion, and belief, simply because of the innate sense of the unsatisfactory nature of these stages of mental labor, which they are foolish enough to endeavor to pass instead of that which satisfies all by demonstration.

It is of great importance to us to be able to determine what particular dominion we are under. This can best be done by giving strict attention to the character of the states.

Feeling is listening, a state of solvency reducing all to indefiniteness, a homogeneous chaotic identity.

Idea is also a state of sameness, not chaotic, but next remove from it, and of so little diversity as to elude the powers of discernment, and each is satisfied with its neighbor, because not sufficiently unlike to prove separate identity.

Knowledge is so clear as to sway the assent of all to its dictate, and hence holds undisputed dominion over all her votaries.

The states respectively denominated thought, opinion, and belief are so very similar, that it requires peculiar clearness of perception to distinguish the small shades of real difference. They are all angular, well defined upon the terminations of their points, and only differ in the num-

ber of these, so that these states have been treated of as a single state, or at most, phases of a state of mental evolution. Hence the ambiguity and diversity among mental philosophers in the use made of the terms.

Those who have done the world the highest service in inventions and teaching them, in discovering and instructing others how to make discovery, have scarcely tasted the advantages which they have bestowed on their race, in other sense than that of anticipating that which they so plainly foresaw.

But this does not say that they had not larger remuneration than it was possible for those to enjoy who made merchandise of the unselfish labors.

Your true teacher learns his lesson long and well, teaches what he knows as he finds opportunity, and yet dies with most of his lesson quite unlearned, and all his teachings but begun.

This you say is a discouraging statement if it be true, to which it may be replied, to all minds who seek ultimate completeness of instant solution to every phase of the desire to know, it is a blank against which they must fetch up until they consent to solve an aspect at a time, exactly as arithmetic does the correlation of numbers.

All units or singulars, as such, can only be added to or taken from each other. But combinations of units or singulars, of like quantity, become amenable to aggregation on a higher scale expressed in multiplication, or of separation of these groups by division, which very much facilitates and shortens the work to be done, not ignoring the ideas of plus and minus in their low estate in addition and subtraction, but enlarging them to a more complex duty and higher sphere of operation.

As we have all the elements of mathematics in the zero, plus and minus, so also have we the elements of all possible mental acquisition and distribution in the simplest rôle of mental movement so soon as this is completed.

This rôle consists in actions which are analogous to breathing, viz., taking in, (inspiring,) digesting, (placing,) and throwing out, (expiring.) A continued repetition of this rôle constitutes mental existence in the first and pneumatic existence in the second instance.

Schools in medicine and surgery have not yet found successful opportunity to inaugurate their highest conceptions of what they ought to be. Would it be wise in the world to demand that they disband those already in existence, and institute no more until the very highest conceivable regulations can be practicalized?

This course would be absolutely fatal, not only to the ideal or model, but the elementary, schools out of which it is ultimately destined to grow by natural advance, if they be but duly nurtured.

Because medical and surgical skill are inadequate to indefinitely prolong the life of man, and because every tooth cannot be made useful for

the full term of life of the patient, and because most artificial dentures wear out, shall we therefore abandon the great good that all these aggregate to individuals in making life not only tolerable but blissful, for longer or shorter periods, during which they would be utterly miserable without?

The demand for dental services awakens the mind to the effort to supply that necessity. And as it is the academic function not only to diffuse but to add to the knowledge of general or special science in accordance with the curriculum it adopts, let us set our best ideal standard before us, and earnestly do all we can to realize its practicalization to those who may seek its instructions as students or its clinics as patients.

In full view of the herculean labor before us, let each member of the profession at large, and each teacher here, pledge himself to do all in his power to make the teachings and practice of dental science and art a legitimate success and a lasting blessing to the whole profession, and through them to the world of dental sufferers who daily apply to them for relief and comfort.

DENTAL INSTRUMENTS.

BY J. S. LATIMER, D.D.S.

COMBINING, as our profession does, the physician, surgeon, and mechanic in one person, few avocations require greater learning, skill, and patient industry to enable us to perform the delicate and often difficult operations required.

We have not the selection and complete control of our materials, but are compelled to operate in all manner of out-of-the-way cavities, in mouths small and moist—on sensitive teeth for nervous patients, and often under such disadvantages that, with the greatest facilities afforded by the very many useful inventions at hand, we cannot say, “behold, it is very good!”

How dentists of twenty-five years ago managed to produce even as good work as they did with the coarse and unwieldy instruments then in use, it is difficult for us to realize. It must be remembered that few roots were filled, and almost as few cavities compounded of more than one surface. With the introduction of adhesive gold, or rather of the welding and interdigitation of the gold in plugging teeth, came a very decided improvement in instruments, assisted very materially by the cordial interchange of ideas, through our colleges, journals, and societies.

At this time, gentlemen are exhibiting their instruments and their processes to their fellow-practitioners with a frankness truly admirable, and the consequence is we are attaining a considerable degree of perfection in our manipulative skill.

Of other instruments I may speak in particular at a future time, but

my object in this paper is to call attention to those for operating in the roots of teeth.

Some months ago, my brother published in the DENTAL COSMOS (January, 1865) the result of his observations of the roots of teeth and the shapes of their canals. The collection of specimens of which he there speaks, and which he has contributed to the museum of the New York College of Dentistry, shows that the canals lessen in diameter as age advances, and that in flattened canals there is often a closing together in the centre, which divides the pulp, and makes two where only one existed in youth.

Of inferior molars, the anterior root was often so partitioned, but several of these teeth showed four distinct canals.

Of course these canals are very minute, and often somewhat tortuous.

Some gentlemen say they remove the pulp perfectly and fill to the apices of the roots, but a very large majority are extremely happy if they make even a tolerably fair approximation, especially in the molars.

One very good reason why we have been compelled to content ourselves with such marked imperfection in the removal of pulps and filling of the canals is the very inadequate idea instrument-makers seem to have of the *smallness* of those canals. Dr. Palmer's nerve-pluggers were, no doubt, made much smaller to the doctor's first order and according to the pattern furnished than the present bungling things. Who can fill any but the largest canals with the best instruments obtainable from the manufacturers? The canals are rarely round; the instruments always so. It is nonsense to attempt to enlarge the canal of a first superior bicuspid root, an anterior canal of an inferior molar, or either of the buccal canals of a superior molar, with a stiff, straight drill. Generally more harm than good comes of attempting it. For removing the pulp we have been provided with instruments which it would be impossible to pass into the buccal roots of a superior molar. We have also been supplied with Swiss broaches, generally coarse, and very imperfectly prepared, the best of which offered to the dentists of New York are made by Mr. Sutton, of the late firm of Sutton and Raynor. But even these were quite coarse, and though very well barbed, were badly injured in annealing.

Meeting with difficulties from the causes enumerated, I set myself to work to devise means of overcoming them to as great a degree as the circumstances would admit.

I procured the finest Swiss broaches imported, annealed them carefully in a closed brass tube, cooled them very slowly, and found I had a tough broach that would enter almost any canal.

The barbing is effected with a thin edged instrument in such a manner as to give some thirty sharp barbs without materially weakening the broach.

After testing these broaches myself I became convinced that they were better adapted to our purposes than any I had seen offered at the dental depots, and gave some to a few prominent gentlemen in the profession, some of whom have declared themselves pleased with their operation.

I do not claim that all pulps can be completely removed with these broaches, nor do I claim that such a desideratum will never be accomplished, but I believe they are superior to any yet offered.

I have been urged to supply the profession with them, and have concluded to do so at the lowest price I have ever heard of prepared broaches being sold at, namely, seventy-five cents per dozen. In the mean time, I will be most happy to give any gentleman such information (if any further is needed) as shall enable him, with a little practice, to prepare them for himself. As to the enlarging of the canals, this is best accomplished when the root is not too much bent, by rotating in it a fine broach with the temper drawn to a spring, or it may, in part, be accomplished with properly-shaped hoes. The Palmer pluggers, considerably attenuated by filing or grinding, answer a very good purpose for introducing and condensing the gold.

In closing, I will say that in very much flattened canals the pulp is frequently split, and a part of it left in, while enough is brought away evidently reaching to the apex of the root to make the dentist feel certain that *all* has been removed. Attention to this fact will save some trouble to the patient.

HOW TO ORGANIZE A DENTAL COLLEGE.

BY J. SMITH DODGE, JR.

Now that a charter has been obtained, and an earnest effort seems making to establish a dental college in New York, it is a suitable time to advance some ideas long entertained with regard to the proper arrangement of such an institution.

The instruction to be imparted in a dental college may be properly divided among six professorships, those namely of Anatomy, Physiology, Chemistry, Dental Microscopy and Pathology, Operative Dentistry, and Mechanical Dentistry. This distribution does not essentially differ from those usually adopted, and it seems to cover all the ground. But it has not been practically noticed that the series naturally falls into two divisions, studies common to all departments of the general science of medicine, and others peculiar to dentistry, anatomy, physiology, and chemistry, are the "three legs of the medical tripod." On them rest, and always must rest, all sound knowledge or practice of any branch of the healing art; and he who does not recognize their paramount importance to the dentist, has yet much to learn of the responsibility and dignity of our art. Nor is it sufficient that the dental student be taught such parts of these

sciences as have an immediate and evident bearing upon his daily practice. A mutilated science is no science at all, either in regard to the consideration which it deserves or the benefits it confers. It is the beauty of every science that its powers of benefiting mankind reach farther than any one man or set of men can divine, and accordingly if we give our pupils only such parts of anatomy, or physiology, or chemistry as we know to be connected with dentistry, we leave out a large remainder which has also its hidden benefits to confer upon our advancing art, waiting to be discovered by our successors. Besides, no part of any science can be thoroughly learned without the knowledge of all the rest. No new discovery in any branch of physiology, for instance, fails to affect and modify our previous notions of some other part in the common domain, and the largest attainments of every science are limited and crippled by our ignorance of what yet remains unknown. Shall we present it to our pupils still further crippled by a voluntary suppression of some things already mastered?

These three fundamental branches, then, should be taught as pure sciences, without being tied down to their special applications, which will be the more easily and perfectly made in proportion as the former have been more thoroughly learned. Now in the City of New York these sciences are already ably taught. Our medical colleges give them especial attention. The ablest teachers, abundant apparatus, copious illustration are amply provided. Why should the dentists of our city undertake to create again what has long been so ably supplied? Let me show first what advantages would come from using these existing means of instruction, and secondly how it may be done with independence and dignity.

The first advantage would be more thorough instruction of the pupils. It is certainly safe to say that there is not a practicing dentist in New York competent to deliver a course of lectures on general anatomy, probably none who could immediately enter on the duties of either physiological or chemical lecturer with success. But in the schools of medicine already established the lecturers are both able and experienced. Again, the accumulation of illustrative apparatus and material for all these branches is not easily nor speedily accomplished, nor without large outlay of money. But here they are already provided and in working order. Besides, the resources of a dental college are sure to be limited at first, and the heavy expenses of chemical and anatomical material and rooms must greatly detract from the completeness of arrangements for practical instruction in operative and mechanical dentistry.

A second advantage, which only a narrow jealousy can refuse to recognize, and which lies very near to the writer's heart, would be a greater cordiality and sympathy between the practitioners of general medicine and of dentistry. Both are shockingly ignorant of each other; each party furnishes some of the most thorough and unscrupulous quacks in the domain of the other; and affected contempt on the one hand, and

answering disdain on the other, have miserably separated these natural friends and allies. An association in several common branches of education must tend powerfully to dispel these wretched prejudices, not only by giving dentists a more complete acquaintance with the foundations of medicine, but also by inviting physicians to become better acquainted with the special science of dentistry.

But some man will say, how can this be done without making ourselves subordinate to the faculty of medicine? Simply thus. Let the trustees of the proposed dental college select, without prejudice or favor, the best of the medical schools, and approach its faculty with this proposal: We desire to appoint the gentlemen who hold your professorships of anatomy, physiology, and chemistry to the same chairs in our college; they will instruct and examine our students, and sign our diplomas. We do not, however, wish them to repeat their customary lectures and demonstrations at our rooms, but desire that students matriculated with us may purchase the tickets of these professors and their demonstrators, and attend their instruction at your college, precisely as if they had matriculated with you. And we offer to reciprocate these privileges with regard to our special branches. This would offer to the medical school a considerable increase of attendance, and of income to the chairs in question, with the sacrifice only of the matriculation fee, while the payment of that fee to the dental college, and not to the medical, makes the students ours, and does not place us in any subordinate, but rather in a co-ordinate position.

These primary studies thus amply provided for, all the energies of the new enterprise can be devoted to the three branches of special dental science, and they can be brought up to the highest grade of excellence. Let the incorporators feel the weight of their responsibility, and remember what is expected of them. There must be no favoritism and no self-seeking. The very best men who can be found must fill the chairs, and if New York cannot furnish three men thoroughly competent, then the time has not come for her dental college. Another failure, only a little more pretentious and elaborate than the former ones, would fill up the measure of disgust, and plunge our dentists deeper in that isolation which has been the bane of dentistry in New York.

One word regarding the course of study. It has certainly been too lax. No man can be made a good dentist by attending two short courses of lectures. Let us imitate frankly the policy of the medical schools, and require certificates of three years' practical study, including two courses of lectures, and let there be no abatement for medical graduates, except that the lectures they attended in the common branches, while studying medicine, may count in place of the corresponding lectures in the dental course. This will exclude some hasty aspirants for the sheepskin, but it will mature those who undertake it, and at once place the New York school at the head of dental instruction, for all institutions of learning are universally judged by the severity of their requirements.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from page 9.)

THE Cystic Tumors of the Mouth are of two kinds, simple and compound. The simple cysts seem to be mere expansions of the outer plate of the bones—wind-bags, as the older writers called them—a fair expression to convey the idea of their character, yet requiring considerable qualification. The second class, the compound, are cysts containing peculiar contents, which contents have induced the cyst and constitute the lesion to be studied; of the latter class, the Odontocoele is by far the most common, and these vary from the simple encystment of a tooth to some perverted development which requires the nicest discernment of the microscope to investigate. Under the head of cystic tumors might also with propriety be noticed those occasional expansions of the walls of the maxillary sinus dependent on engorgements.

THE SIMPLE CYST.—All writers on surgery have remarked the existence in the mouth of this form of tumor. A simple expansion of the bone with varying fluid or gaseous contents; different authors differently describe and name them. The term *spina ventosa* is, perhaps, about the most unmeaning that has been applied to them. As I *know* them, their history may be written as follows: There is first remarked on the side of the jaw, either superior or inferior, (no preference seems to exist,) a slight flattened enlargement; this increases slowly, until the swelling reaches the size of half a hickory nut. I have never seen one larger; no pain attends the enlargement, and outside of a mental disquietude necessarily induced, no functional or other constitutional disturbance attends. The slowness of growth is such that it requires from one to three years to reach the size alluded to. This slowness of growth and absence of pain and constitutional disturbances constitute marked diagnostic signs. Another sign, and one on which every writer with whom I am acquainted lays particular stress, is the giving forth, on pressure, of a parchment-like crackling; with this last sign I seem, however, to have had a peculiar experience, for while I have treated quite my share of such cases, it has not been my fortune to find such crackling sound in any single one of them, and while, of course, it would ill become any individual to assert that such a crackling never can be felt or heard, yet I would impress that such a sign is not by any means an ever-present indication, and consequently is not to be given the heed demanded for it. In most of these tumors on which I have operated, septi, more or less in number, have been found supporting the vault, and with the existence of such pillars it is plainly enough seen the yielding would be out of the question, so that the practitioner is not to be deceived by the firm character of the tumor.

The gum covering these cysts is always perfectly normal; no congestion, no anything indicating its implication; a matter important to observe, as, should the diagnose be in anywise obscured, the practitioner would have, at least, the satisfaction of feeling a tolerable assurance as to the benign character of the growth as well as to its non-acute character.

I might remark that of the number of tumors of this class that I have seen, every one of them have been situated in the outer or vestibular walls of the bones. Why they should be so, or indeed whether it is always the case, I do not know. I only offer my own experience.

The diagnose made out, the cure of these cysts is very simple. A common treatment, and one generally practiced by myself because of its little trouble, is to make a crucial incision through the body of the tumor and breaking up such septi as I may find, stuff the cavity with lint saturated with the tincture of iodine; this, if there is no foreign body in the cavity, as, for instance, the root of a dead tooth, will invariably cause the base to throw out granulations, and thus obliterate the cyst.

Another mode not unfrequently resorted to, is to dissect from the tumor in flap-form the overlying gum, and with a chisel cut away the vault of the cyst; the parts are then carefully syringed and the flap laid back in place. This latter form requires much more time, much more skill, and gives much more pain. The first is not nearly so objectionable to the patient, and is equally as effectual.

Concerning hæmorrhage, little anxiety need be felt. I never found it give any trouble; it may be necessary to syringe the cavity with a little alum water, or some other astringent, but even this is not commonly needed.

THE COMPOUND CYST.—In this class of cystic growths we have that running together of the benign and malignant conditions which make so necessary to their proper appreciation that kind of knowledge alluded to in my previous paper. Without doubt, the osteo-dental tumor, or odontocoele, is by far the most frequent type of the compound-cystic growths, but then these so closely blend with that class known as the osteo-sarcomatous, that it can only be by judging of the foundational structure, so to speak, that one finds himself not soon at sea in his estimate of these cases.

Not then, in the outstart, to confuse our subject, we will say that we mean here, in the use of the term compound cysts, cysts which contain irregularly developed teeth, understanding the nature of which, we may pass to carcinoma, or osteo-sarcoma, without confusion, even although in such connection we shall have occasion to exhibit these also as primarily of cystic character.

A common odontocoele is the simplest form of osteo-dental tumor, and is by far the most frequent form of oral compound cysts. They may present themselves in any part of the maxillary structure, and, what is of

much importance to remember, may have, as the primary lesion, a supernumerary tooth.

Illustrations. July 2d, saw a young lady, aged, I suppose, about sixteen, having a tumor, intra-maxillary evidently, occupying the anterior left side of the hard palate.

This young lady, being the child of wealthy parents, has enjoyed the advantage of consultation on her case. Much difference of opinion was the only result of the meeting.

Now her exact condition is as follows: She has never had a single tooth of the permanent set extracted, and yet she lacks, to make up the complement common to her age, the cuspidate of the diseased side. Those who consulted on her case overlooked this striking deficiency, and hence their confusion. The tumor is, of course, dental, or, at least, so great is the probability of such being its character, considering the absence from the dental arch of the tooth, that any surgeon would feel justified in founding a proposed operation on such data.

(To be continued.)

THE RUBBER DAM.

BY C. E. FRANCIS, NEW YORK.

NEW theories, however well established, and new inventions, though successfully tested, are not apt to readily meet with public favor. It is a difficult matter to eradicate old fossilized opinions of consequential professional men, who are too ready to utter a skeptical growl when some progressive innovator intrusively thrusts forward his advanced ideas, with a view to enlighten and benefit his less illumined fellows. It has been said that none are so blind as they who *will* not see, and it *does* seem as if many men really prefer to plod along in the dark rather than be guided by the light that radiates from some more active brain.

The scholarly mind that penetrates into the nebulous researches of science, and exhibits to the world the fruits of his investigations, is looked upon as a sort of wild visionary schemer; and the ingenious artisan who would bless mankind with the result of his labored efforts is too often greeted with the epithet of *humbug*.

The operative dentist, while laboring faithfully to fulfill his professional duties, meets with many difficulties that must be overcome, which sometimes severely tax his skill and patience. One of the most trying of these difficulties is to contend against, or to control, the unwelcome contributions which flow from the salivary glands. That the operation of plugging teeth with gold may be properly and satisfactorily performed, it is absolutely necessary that no moisture should come in contact with the gold while in the process of being consolidated. In filling approximal cavities, where it seems particularly important that moisture be excluded,

the patience of the operator is put to its severest test; and cavities located on the approximal surfaces of the inferior teeth are of course the most troublesome in this respect. How discouraging to the dentist, during his fatiguing operations, to observe the streams of saliva pouring copiously from the ducts of Steno and of Wharton! Who has not often wished that these famous anatomists had never existed, or at least had never discovered those provoking salivary ducts that cause us so much trouble! To come practically to our subject, let us suppose a case. An inferior bicuspid is decayed on either its posterior or anterior surface, and the cavity extends to the margin of the gum. You prepare it for filling, your gold is cut in various-sized pieces and arranged with mathematical precision; your pluggers, carefully selected, lie before you; your napkins folded in proper shape, strips of bibulous paper, and bits of spunk, are conveniently within your reach. Do you use the mallet? Your assistant stands in readiness with mallet in hand. Your annealing lamp is lighted, and your heart fairly leaps as you commence your task. The mouth is crammed with napkins or paper, despite the protestations of the restless tongue, and the disposition to gag on the part of the patient. Finally, however, all is properly adjusted to the best of your ability, and amidst hopes and fears you commence introducing the gold. The foundation pieces are soon laid and securely anchored to the cervical wall, while one pellet after another is added to the base. It must be confessed that you feel somewhat hurried, for the "swamps" wear a threatening attitude. The cavity is half-filled with gold and the mouth with saliva—the patient desires to swallow—you protest—he gags, and his swimming eyes fairly protrude from their sockets as he vainly endeavors to desist. You change your napkins or wads of paper with as much celerity as possible, but a movement of the "unruly member" has caused the saliva to deluge your filling. The consequences are of course apparent. Suppose you have a cavity to plug on the approximal surface of a superior incisor. How can it be kept perfectly dry for a sufficient length of time to complete the operation? In some cases you may have but little trouble, though in many cases it is a difficult matter to exclude moisture, particularly when the gum has been wounded during the process of preparation.

Wedges of orange wood forcibly driven between the teeth will sometimes answer a tolerably good purpose, but the cavity frequently runs beyond the margin of the gum, and few patients will submit to having the wedge driven beyond that point. Even would they submit to this it will not invariably prevent leakage from above, and where the adjoining tooth is missing it cannot be used at all.

Now who will deny that it is much pleasanter to operate upon teeth where no moisture can intrude, or that results will prove more satisfactory. Many teeth are imperfectly filled, and perhaps ruined, from the renewed attacks of decay upon the poorly protected walls around the plugs. Thus,

however careful the operator, and however honest his intent, his reputation is likely to suffer from causes which he vainly endeavored to control.

There is (thank Heaven) a very simple method of perfectly excluding both blood and saliva in a great majority of cases, and where also even the moist breath cannot become condensed upon the plug. I allude to the application of sheet rubber, which was first used and introduced to the public by Dr. Barnum, a worthy and progressive member of our New York Dental Society.

Strange as it may seem, very few, comparatively, are willing to take the "trouble" of fairly testing this most valuable discovery, which, to those who understand its use, is indispensable.

A small piece of sheet rubber about the thickness of a wedding card, and from four to six inches square, is all that is required. If the tooth stands alone, a single hole may be cut near the centre of the rubber, in diameter about one-third that of the tooth, and through which the tooth is to pass. With a small flat burnisher work the edge of the rubber around the neck of the tooth, toward the alveolus, as far as possible. If the tooth has "near neighbors," cut holes sufficient to let several of them pass through, and allow the perforations to be from one-sixteenth to one-quarter of an inch apart, according to the proximity of the teeth, allowing sufficient margin for working it pretty well under the gum. The rubber will generally pass between the teeth with little trouble, but if the teeth are too stubborn to move, bring a piece of waxed floss silk to your aid. A little practice will soon enable you to apply it readily. Now you can operate with a great degree of satisfaction, feeling that your enemy is powerless to create mischief. You can dispense with napkins or paper for stuffing purposes, and your patient can actually swallow, or close his mouth for a moment's rest, without injury to your filling!

Gentlemen of the profession—learn to use Barnum's rubber dam, and, when you thoroughly understand its true merit, you will bless the name of the worthy dentist whose ingenuity gave us so valuable a boon.

ANNEALING GOLD FOIL.

BY W. H. WAITE, D.D.S., LIVERPOOL, ENGLAND.

THE best method of preparing foil is certainly one of the most important questions we have to consider, and is therefore a subject of interest to all practitioners of our useful art. There can be little doubt that in whatever form we propose to use foil, whether rope, cylinders, ribbons, or what not, the more adhesive, and at the same time the more pliable the foil, the greater the facility with which it can be worked. But how are these qualities to be universally obtained?

We have foil prepared for us by the manufacturers, "adhesive," and

"non-adhesive," "crystal," etc., and each of these are preferred in their turn by those who succeed in obtaining the best results with them. Still we all find, more or less, that there are cases in which it seems next to impossible to make a good filling, and admitting all the effects of close application, pressure of business, and other professional disquietudes, there is yet no doubt that now and then the condition of the foil is alone responsible for the want of success. It has been alleged that exposure to the air, even though shut up in the book, in process of time destroys the malleability, or ductility of gold foil; and I remember my friend Dr. McManus, of Hartford, Conn., an excellent operator, telling me that he attributed his success in gold filling very much to the fact that he could step from his office into the shop of the manufacturer and obtain fresh foil just as he required it. But there are not many of us so fortunate as to be able to obtain our foil in this way, and the question arises, can the manufacturers so prepare the gold books as that exposure to the air may be avoided? If they could, we might easily get over this difficulty, even though compelled to procure a quantity at a time.

Again we are told that foil which has been made from the same melting, and subjected to precisely similar processes, occasionally varies in character sufficiently to cause considerable differences in the results of operations. That the character of the foil in one book differs materially from that in another is an oft and well observed fact. The question is, wherein does this difference lie, and how can we remedy the defects presented? A little careful observation has led me to think that this variation is entirely ascribable to unequal annealing during the rolling and beating, and as this inequality *may* be unavoidable, our attention is called to the mode of rectifying the imperfection, which (as I take it) can be done most effectually by reannealing. According to some this may be accomplished by passing the pellet or rope through a spirit lamp just before introducing it to the cavity. Considerable adhesiveness may be thus obtained, but in my experience this method invariably produces a hard unyielding pellet, which refuses to be conformed to the required shape, *except where the mallet is used*. A better plan is that laid down in Dr. Arthur's work, viz., laying the sheet on a piece of platina gauze and passing over the flame, but in this way I have found the foil frequently very obstinate. A third mode of procedure is that described by Mr. Marshall, of Wilmington, Del., in the *Dental Quarterly* of December, 1864, by boiling the foil in water for three minutes and then placing in the oven to dry. This I have tried, and must confess that I was unable to detect any increase whatever in the adhesive property, though the foil so treated was certainly much softer than before.

The method which I have found most successful is that which, for want of any other appliances, I was driven to adopt when from home some time since, and is as follows: Having prepared the cavity, the foil is re-

moved from the book and laid on the flat top of a stove or oven, or any other smooth surface over a fire, the iron being just hot enough to prevent keeping the hand on it, and not much more. The foil in a few seconds attains the same temperature, whereupon it is picked up with the thumb forceps and rolled into rope or pellet immediately, and as soon as sufficient is prepared the cavity is filled.

The foil which I find most easy to manipulate is that sold by S. S. White, and as of necessity it must be far from fresh before it reaches this side the Atlantic, one is naturally curious to know what is the readiest and best mode of preparing the foil hitherto discovered.

10 OXFORD STREET, LIVERPOOL, Sept. 29, 1865.

TREATMENT OF A CASE OF IRREGULARITY.

BY ISAAC WOOLWORTH, NEW HAVEN.

I HAVE recently treated an interesting case of irregularity, not a formidable one at all, but interesting to me, on account of the simplicity of the appliance, and the facility with which it was corrected. Believing it might be of use to some of your readers, I give you a description of the case and the appliance used, which suggested itself to me for the first time, although it may not be new to some. The case was in the mouth of a lad fifteen years old. The distorsions were the left central superior incisors and both laterals, falling inside of the arch and closing inside of the inferior incisors. This case had been under treatment about a year and a half, by the use of a plate and inclined plane, before it fell into my hands. I took an impression of the entire jaw and teeth, as far back and including the six-year old molars, and made a plate or cap of hard rubber over all the teeth, not however covering the palate to a very great extent. I placed a quantity of plaster on the cast in front of the deflected teeth, so that the plate would arch out at those points, and filed the plate so as to expose the cutting edges of these teeth about half their height. I then drilled two holes opposite each tooth I wished to move, tied some strings of strong cotton thread around each, and passed the ends through the holes and tied them fast. I renewed the strings daily for four weeks, and dismissed the case perfectly corrected, with instruction to wear the apparatus in the same manner, except in tightness, four weeks and longer, if the teeth inclined to fall back. The advantages of this fixture are in its simplicity, the ease in which it is worn, the constancy and uniformity of the tension, the certainty of keeping the jaws asunder so as to insure the transit of the deflected tooth over the under tooth, the ease with which it is adjusted from day to day, and it causes no soreness to the gums. Others may be using a similar contrivance, or better. It is the best thing I have ever used.

REPORT OF OPERATIONS.

BY FRANK ABBOTT.

I WOULD respectfully submit the following report of my operations during the past year in the treatment of exposed pulps, teeth in which the pulps had previously died, abscesses, etc., to the profession, to show the progress that has been made in the last few years in the treatment of this class of teeth, and to induce, if possible, others to make similar reports, that we may all profit by understanding the success our brethren meet with, and their manner of treating these troublesome cases.

Whole number treated.....	91
Males.....	42
Females.....	49
Incisors and cuspids.....	19
Bicuspid.....	28
First molars.....	27
Second “.....	9
Third “.....	8
With living pulps.....	49
Devitalized with arsenic.....	48
Arsenic failed, and extirpated.....	1
Sound pulps dead and no abscesses.....	16
Requiring treatment subsequent to filling.....	6
Abscesses treated and cured.....	26
Average number of dressings required.....	2

My treatment of these cases is probably the same as practiced by all who attempt to treat them faithfully, with perhaps one exception; that is, the treatment of abscesses. We often hear dentists talk of dressing abscesses every day for from eight to fifteen days, to effect a cure. Unless I have an extraordinary case, I never dress them but once, and in nine cases in every ten they will heal perfectly in ten days.

For my mode of treatment I will refer the reader to the “Proceedings of the Brooklyn Dental Association,” of March 15, 1865, published in the May number of the DENTAL COSMOS.

NEW YORK, August 1, 1865.

AIR-CHAMBERS FOR RUBBER WORK.

BY R. J. H.

TAKE a piece of block tin and pass it through a rolling-mill, or by hammering reduce to the desired thickness, and then cut it with your shears to any desired pattern or shape. When your case is ready to pack, take this pattern, and after selecting the position which the chamber is to occupy, fasten or stick it on the male form with the ethereal solution or

liquid silex, pressing it down with a blunt instrument to the inequalities of the arch. Let the solution dry a few minutes, when you may proceed packing and pressing the flask together as usual. After the case is vulcanized and removed from the flask, carefully remove the pattern—which will be found imbedded in the case—by inserting the blade of a penknife under it. It may be removed easily without injury, and can be used for the same purpose repeatedly. I have used this method in my practice during the past ten or twelve months, and find it makes a beautiful air-chamber. Try it, and judge for yourself!

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF AMERICAN DENTAL CONVENTION.

REPORTED BY W. C. HORNE, OF NEW YORK.

THE eleventh annual meeting of the American Dental Convention was held at White Sulphur Springs, Ohio, commencing on Tuesday, August 1, 1865.

In the absence of any of the officers, the meeting was called to order, at 11 o'clock A.M., by Dr. W. H. Atkinson, and a temporary organization effected; Dr. H. E. Peebles, of St. Louis, being elected President, and Dr. H. A. Smith, of Cincinnati, Secretary *pro tempore*.

Dr. Atkinson presented the following order of business, which was adopted:—

- I. Reading the Constitution.
- II. Admission of Members.
- III. Reading the Minutes of last Convention.
- IV. Reports of Officers and Standing Committees.
- V. Election and Induction of Officers.
- VI. Reports of Special Committees.
- VII. Miscellaneous Business.
- VIII. Discussions, in the following order:—
 1. Dental Education.
 2. Operative Dentistry.
 3. Dental Hygiene.
 4. Microscopic Illustrations.
 5. Dental Pathology.
 6. Artificial Appliances.
 7. Miscellaneous Discussions.

By request of the President, Dr. Taft read the Constitution of the Convention.

An assessment of one dollar per member was then laid, and the gentlemen present paid the same and signed the Constitution.

The minutes of the last annual meeting were then read and approved. Reports of officers and standing committees were called for. No offi-

cers present. The Committee on the Kingsley medal was called. Dr. Atkinson, the only member present, said the committee had no report that he was aware of. He did not know whether anything had been done in the matter. Several motions being made on the subject, it was finally laid on the table till the next day.

The next order of business being called, viz., the election of officers, on motion of Dr. Buckingham it was made the special order for the morning hour to-morrow.

On motion of Dr. Taft, the sessions of the Convention were ordered to be from 9 to 12.30 A.M., and from 2.30 to 5.30 P.M. Adjourned.

Members of the Eleventh Annual Meeting of the American Dental Convention.—H. E. Peebles, President, St. Louis, Mo.; H. F. Bishop, Vice-President, Wooster, Mass.; L. Buffet, Corresponding Secretary, Cleveland, O.; H. A. Smith, Recording Secretary, Cincinnati, O.; H. Benedict, Treasurer, Detroit, Mich.; J. Taft, Cincinnati, O.; W. H. Atkinson, New York; T. L. Buckingham, Philadelphia, Pa.; S. S. White, Philadelphia, Pa.; W. C. Horne, New York; C. Palmer, Warren, O.; C. M. Kelsey, Mount Vernon, O.; W. E. Dunn, Delaware, O.; J. B. Beaumary, Columbus, O.; E. E. Rogers, Hudson, O.; G. W. Field, Cincinnati, O.; H. M. Edson, Mount Vernon, O.; W. N. Morrison, St. Louis, Mo.; W. A. Duff, Philadelphia, Pa.; A. J. Dunn, Delaware, O.; J. B. Bennett, Mount Vernon, O.; H. C. Fowler, Mount Vernon, O.; P. Harris, Skaneateles, N. Y.; L. D. Walter, Cincinnati, O.; A. W. Maxwell, Galion, O.; J. F. Siddall, Oberlin, O.; W. F. Morrill, New Albany, Ind.; W. C. Cahoon, Detroit, Mich.; M. De Camp, Mansfield, O.; J. G. Templeton, New Castle, Pa.; R. W. Varney, Newburgh, O.; W. P. Hall, Piqua, O.; C. C. Dills, Piqua, O.; H. Tod, Columbus, O.; Elmer Haus, Tecumseh, Mich.

FIRST DAY—*Afternoon Session.*

The President called the meeting to order at half-past two. The minutes of the morning session were read and approved.

Miscellaneous business being in order, Dr. Taft read a letter addressed to the President of the Association, on "Dental Education," by Dr. S. J. Cobb. The communication was received and ordered to be filed.

The report of the committee appointed to prepare a Dental Catechism, for publication in school-books, being called for, Dr. Taft said he had not been able to give his personal attention to the matter, and he was not aware that other members of the committee had done anything.

Dr. Kelsey favored the discharge of the committee. He considered such treatment of the subject would be extra professional.

Dr. Atkinson considered the school-book just the right medium through which to impart primary instruction on the care of the teeth. Their imperfect condition was the chief cause of the derangement of the human system. He hoped that children of ten might soon know more about

the nature of teeth than many physicians have within the last few years. These organs are subservient to unseen laws, that are nevertheless capable of being understood, and it is our duty to learn and to teach them. Our gospel is "Sound Teeth," and it is our duty to preach it to all the world.

Dr. Dunn had taken a deeper interest in this subject than in any other that had come before the Detroit Convention. He expressed his disappointment that the committee had made no report and taken no action.

Dr. Buckingham thought that our real need was for a brief concise work on dental hygiene. We educate our patients every day by our operations. He laid great stress on keeping the teeth clean, referring to a person in Philadelphia who advertised, for \$30, to teach how to clean the teeth. He cleaned his patients' teeth, and supplied them with brushes, dentifrices, soap, and silk thread, all of which he instructed them how to use. He did not think that man so much of a humbug after all.

The Committee on Dental Catechism was then discharged.

Dr. Buckingham offered the following, which was adopted:—

Resolved, That this Convention, recognizing the importance of preparing a proper treatise on Dental Hygiene for the use of the public, recommend the performance of this work to the members of the profession.

The subject of Dental Education was then taken up for discussion.

Dr. J. Taft thought many of us do not sufficiently appreciate the importance of thorough education in our specialty; those who are practicing without this preparation should at once ask themselves whether they ought not to stop. The highest aim of the medical practitioner, whatever his specialty, should be to preserve the human system at its highest point of development; but how few do make this their study and aim! But a few days since he had seen the daughter of an intelligent physician, who was desirous of having the six-year molars extracted, and who could hardly be persuaded that these were permanent teeth, and this erroneous impression she had received from her father. There were also dentists not less ignorant. Such an one he knew who directed his patients to brush their teeth with a little pure water. A depression of the constitution caused an impaired condition of the teeth; in order then to practice successfully we must have a thorough understanding of the constitution and its action on the teeth. In this respect we had been very backward, knowing little of what we ought to; we must know more. He had met darkness and difficulties at every step, and been hedged in by ignorance. He hoped no young man would enter the profession without being equipped with every agency of success. What are these agencies now? We have schools, associations, journals, and books. It was not so when he entered the profession; but now these means of education are not sustained as they should be. The mass of our profession give no as-

sistance at all to our schools, they rather dissuade than encourage a student to enter. These institutions should be sustained, we have none too many of them. If the teachers are behindhand, supply their places with better men; there is improvement in this matter, but it is not fast enough. Our journals are not all they should be, but that is not altogether the fault of those who conduct them. He looked upon the spirit of associated effort as the most hopeful feature of the case. We should induce only the men who showed the most adaptability to come into the profession; the responsibility of turning off, as dentists, men who are not at all fitted for the position, was one too heavy to be borne.

Dr. Benedict, of Detroit, stated that the Michigan State Dental Society had petitioned their legislature to add dental professorships to the other chairs of the State University. This institution is endowed by the State, so that the professors have no object but to make their standard of education as high as possible. On the reference of the petition to the medical faculty they fully concurred in its object, and promised their hearty support. They thought the dental students should be ahead of the medical to the extent of their specialty. They were willing to give the dental course one chair at present, and another as soon as practicable. The regents inquired "Who are your men?" and here lay the chief difficulty.

Dr. Atkinson believed all advancements came from the necessities that environ us. We owe dental colleges to Chapin A. Harris. He brought together all that was known concerning dentistry into an incongruous mass, which were taken to be principles till they proved not to be. He thought we have as good faculties, considering our position, as the medical schools, but when we look at our ideals we must put our hands on our mouths and our mouths in the dust. The doctor referred to the efforts lately made in New York to establish a school of dental science, and the successful obtaining of a charter for a college from the last legislature. The faculty had not yet been named, but it was hoped it soon would be. New York could certainly support a dental college as well as any city in the country, and better too. He considered the use of a diploma to be merely a stepping-stone to higher attainments.

When a patient is in need of operations he will be willing to do anything which will contribute to a successful result. Let us then be earnest workers together, and have the honesty to say This can be done best by such a man—doing to others as we would they should do to us.

Dr. T. L. Buckingham said, in adopting a course of college instruction it was necessary to bear in mind that the professorships must be supported, and success might be defeated by making the standard too high or too low. The doctor dwelt upon the advantages of a systematic course of education, collegiate and clinical, to young men. In reference to the number of collegiate institutions, he was only opposed to competition between

institutions located in the same city: in different cities or States, dental colleges are a benefit; we have not near enough of them. The chief Philadelphia colleges of medicine can command the best men in the country, because they can pay salaries of from \$5000 to \$10,000, while the dental professors are never paid more than \$500 per annum. He favored, and hoped to see introduced among us, the plan of the French Academy, in which the student was first instructed in general scientific principles, and thus prepared for the study of any specialty he chose. He greatly regretted the meagre support granted to the dental journals, and that their articles were not equal in ability to those in the older professional magazines; this was not for the lack of competent men, but because those who can won't do the work.

Dr. S. S. White thought it might be well to state a fact, learned while in Chicago, which had given him much pleasure. A second medical school had been started there, with the avowed object of raising the standard of collegiate education. In the furtherance of this plan, they extended the college sessions to six months, demanding of the student, as a condition of acceptance, a more thorough preparation than had previously been exacted.

It was stated that the experience of some five years had justified the confidence that thoroughness of teaching would be appreciated. The students presenting themselves were a superior class of young men, already accustomed to study, whose object was to gain knowledge, and who did not object to a six months' course with its additional labors and advantages.

He thought those in error who supposed that the majority of young men making choice of a scientific pursuit for life, would be decided in selecting a school, by a belief that a *degree* could be had in less time, for less money, and with less labor than was required elsewhere.

He believed that, other things being equal, those institutions which offered to the student the best opportunities for thorough training in every department of his specialty, would, sooner or later, be the most liberally sustained.

Dr. J. Taft held that every institution of learning should raise its standard of education yearly; and that no man should be matriculated in a dental college without a preliminary examination on literary and scientific subjects. There was every inducement for college and student both to take the highest course. Those who will shrink from such an examination are generally not worth having. In Cincinnati, under the impression that the examinations were too rigid, many at first withdrew; but the number of these became less, and a superior class of men presented themselves.

The Report of the Treasurer was now presented, showing a balance in the Treasury of \$———. It was referred to an Auditing Committee,

who declared the same correct; and the Treasurer was directed to balance the accounts of his predecessor.

Adjourned to Wednesday morning.

SECOND DAY.—*Morning Session.*

The Vice-President, Dr. Bishop, having arrived, took the Chair. The minutes were read and approved.

The President pro tem., Dr. Peebles, in taking leave of the Chair, made reference to his efforts in St. Louis to effect an organization of dentists. This was the first of its kind west of the Alleghanies, from which numerous others have sprung. He did not approve of multiplying dental colleges, but preferred to see those in existence well supported: he thought it would be many years before St. Louis would need one. He did not think two years at all sufficient for a young man to become a proficient; he had been practicing for thirty years; the first year he knew everything, the second less, and so on every year he had been unlearning and finding out how much he did not know; he favored a most thorough course of instruction for the dental student. He prized highly a state of sociability among professional brethren; they enjoyed this in a high degree in St. Louis; he wished the counsel and assistance of his brethren on one occasion, and sent to six of them a card, bearing on it the words "Come now," and almost as soon as his messenger returned they were all in his office—some of them leaving patients in their chairs. He believed the present meeting would be extremely useful, and returned thanks for the honor done him.

The special order, being the election of officers for the current year, was now taken up.

Drs. Buckingham and Buffet were appointed tellers.

The members then proceeded to vote by ballot, with the following result:—

President.—DR. H. E. PEEBLES, St. Louis, Mo.

Vice-President.—DR. H. F. BISHOP, Wooster, Mass.

Recording Secretary.—DR. H. A. SMITH, Cincinnati, Ohio.

Corresponding Secretary.—DR. L. BUFFET, Cleveland, Ohio.

Treasurer.—DR. H. BENEDICT, Detroit, Mich.

Drs. Atkinson and Benedict were appointed to conduct Dr. Peebles to the Chair.

Dr. Peebles returned thanks for the honor done him, and desired the co-operation of every member in the discharge of the duties of his position.

The subject of Dental Education was again taken up.

Dr. Smith, of Cincinnati, adverted to the necessity of preliminary training before entering any college; in order to study well then, the student must have formed habits of study previously.

A running discussion ensued between Drs. De Camp, Siddall, Cahoon, and others on the acquirements and practices of their various students.

Dr. Buckingham said that the fact was men were recognized as dentists, three generations of whom were turned out in as many months. He had known of an old practitioner bringing one of his students (?) to a dental depot to buy him a vulcanizer; this student shortly returned with his student, and the second with a third, all within three months, and all turned out, full-fledged dentists, to fleece different communities.

Dr. Horne offered a resolution, that this Convention adjourn on Thursday noon, to meet in the City of New York on the first Tuesday of August, 1866; which was carried.

Dr. H. A. Smith read a paper on the "Correlation of Forces." After some flattering remarks by Dr. Atkinson, Dr. Smith proceeded to say that the subject was a very clear one to him, though it had required great study to make it so. He believed that one force could be converted into another, the theory being that all are one and the same. His paper was one which he could have extended very greatly, making the whole matter very clear; he would not be willing that it should be published until he had made it more complete.

Dr. Buckingham said that he had read all the works on the "Correlation of Forces" which had been published, and proceeded to sketch their main points of difference. Newton's theory was, that heat was a substance; but it is now believed that it is a motion, and, in the conduction of heat, the first atom being set in motion, gives an impetus to the next, and so on. This is the manner in which the nerves convey impressions to the brain. Different bodies convey motion with varying degrees of rapidity; but there is only one continuous force, and of course but one original motor. It being admitted that the force may be modified, and the motion become less and less, it appeared to him that it must also arrive at a point of cessation, which appeared an insuperable objection to the whole theory.

Dr. Smith mentioned bark as a poor conductor of heat, and useful for capping. He suggested the propriety of covering the surface of sensitive dentine with a solution which might, on evaporation, afford a non-conducting surface.

Dr. Buckingham mentioned colodeon or Barker's solution as suitable applications.

Dr. Atkinson mentioned his manner of saturating the dentine with creosote previous to plugging; also of protecting a nearly exposed pulp by a layer of Hill's stopping, covered with a gold cap, and held in position by bone-filling; in the case of an exposed nerve, a solution of gutta-percha in alcohol was just the thing to take the place of the Hill's stopping. Dr. Allport's method consisted in cutting away with a

delicate instrument a portion of the pulp, leaving flaps to come together and heal by first intention.

Dr. Buffet objected to the use of creosote for obtunding an exposing nerve, as he found it would effectually destroy it with a single application.

Adjourned to afternoon.

SECOND DAY.—*Afternoon Session.*

The Convention was called to order by the President, Dr. Peebles, at half-past two. The minutes of the morning session were read and approved.

The Convention took up for discussion the subject of Operative Dentistry.

Dr. Smith referred to the practice of Dr. Allport as only applicable if there were a part of the pulp diseased, or some excrescence which it was desirable to cut off.

Dr. Cahoon thought that Dr. A.'s practice might answer if such cases did not occur oftener than once a year. In operative dentistry he had tried everything plausible he had ever heard of. He that can do the most good is the most successful operative dentist. That was the conviction to which he had come.

Dr. Taft found the field of operative dentistry to be a very large one, because so many views and practices obtain; every case has its own difficulties, on account of peculiar condition, saliva, position, smallness of mouth. In many cases it is unsafe to rely on the general form of the cavity for retaining a filling, and then he made special retaining points or anchorages; these should be firmly set, and the force brought to bear as near as possible at a right angle throughout the whole operation, especially at the cervical wall. The treatment of pulps must be of as infinite a variety as the cases themselves. A tooth is always better with the pulp than without it, and it does not become perfectly necrosed when the pulp dies. We ought to retain living tissue whenever possible, and when the pulp is saved alive it should be so covered that no vacuum shall be left. The plan of treating the pulp by depletion, to reduce inflammation, was also adopted by Dr. Hullihen. The originators of a particular method generally have more skill in producing the best effects with it than others. In deciduous teeth the pulps can be very easily removed, without any arsenic, by a simple operation. The method of using gold, especially adhesive gold, was by the mallet, which he used wherever it could be brought to bear. A great deal of the success of an operation depended upon the compatibility of the patient. He came in contact occasionally with persons for whom he would not attempt to operate. He preferred to have all the circumstances as easy as possible.

Dr. Horne made a few remarks explanatory of the process of repro-

ducing in gold the lost parts of a tooth, illustrated by some beautiful specimens in plaster of Dr. Peebles' operations.

Dr. Morrison narrated a case where, having extracted a bicuspid tooth, he filled it, and after a lapse of three hours replaced it in the socket, and it was worn for three days. At the end of that time there was some soreness, and at the request of the patient's physician he removed the tooth, being of the opinion, from its appearance, that a healthy reunion would finally have been effected.

Dr. Peebles' practice was to remove the pulp in the front teeth without any arsenious or other appliance; he had not succeeded in doing this in the molars and bicuspids. He always performed the separation of teeth at a single sitting, using a rubber wedge at the crown to save all that the wooden wedge gains at the neck. In approaching posterior cavities he cut away enough of the crown to see and reach every recess, filling crooked fangs with cotton and creosote well compacted. He used the mallet, and finds it much more easy to his patient and to himself.

Dr. Morrison exhibited one of Dr. G. E. Hawe's duct compressors, with an improvement in the catch.

The Committee on the Kingsley medal were granted further time to report.

Adjourned to Thursday morning.

THIRD DAY.—*Morning Session.*

The Convention was called to order by the President at the usual hour. The minutes of the last session were read and approved.

On motion of Dr. Horne, seconded by Dr. Buckingham, the following resolutions were adopted, namely:—

Resolved, That this Convention urge upon the members of the dental profession the importance of subscribing for one or more of the dental journals, as the means of conveying valuable information and suggestions on the progress of our specialty.

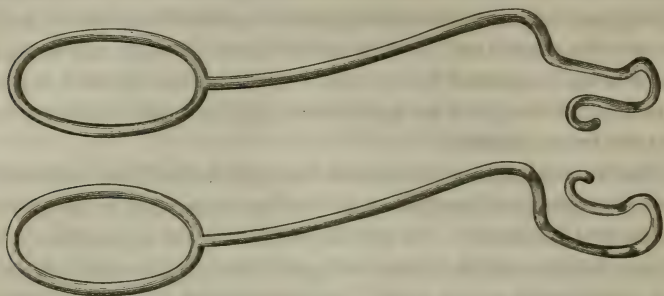
Resolved, That we renew our testimony in favor of a high standard of professional skill and scientific attainments, and commend to all dental practitioners that their students be required to undergo a thorough course of reading and instruction, preparatory to such collegiate education as may entitle them to the diploma of some one of our dental colleges.

Resolved, That this Convention, recognizing in the formation of dental societies in different parts of the country the brightest and most hopeful sign for the future of our profession, desire that their benign influence may be extended to every village in the land.

Resolved, That we pledge ourselves individually to use every means in our power to attend the next annual meeting, and to induce our brethren to do so.

Dr. Corydon Palmer, of Warren, Ohio, presented to the Convention a pair of instruments, adapted to either side of the mouth, for holding the napkin in place and compressing the sublingual ducts.

Dr. Palmer's instruments were received, with the thanks of the Convention, their utility having been demonstrated upon one of the members



present. Dr. S. S. White was requested to manufacture copies for the profession from these patterns.

Dr. Peebles, in filling anterior approximal cavities in lower teeth, used a prop of wood notched at the ends, and set against the posterior wall of the lower tooth, while the patient bites on the other end. In this way he saved something of the shock on the tooth, and kept the mouth open.

Dr. Taft being called upon to explain his manner of using some instruments, said that in cutting away parts of a tooth he much preferred the chisel to the file. By this instrument the same results can be attained much more rapidly, and with far less strain upon the feelings of the patient, especially when there is much sensitiveness in the tooth. A few decisive cuts in such a case accomplishing, with little pain, what would require a tedious and painful amount of filing. He preferred to cut a tooth, so as to get at all parts of the cavity with straight instruments, because in proportion to the number of curves in the instrument, precision and power are lost. The plugging instrument, when used with the mallet, should be held like a pen, and a good malleter was very necessary to rapid and perfect operating.

As to removing the green stain from enamel, it should be done with suitable instruments and the surface polished. The enamel should never be marred where it is perfect, but only when attacked by some form or other of disease should it be operated upon. The green stain is not in itself the injurious agent, but only a deposit, formed by the action on the teeth of the salivary secretions in an acid condition, arising more from the state of the mouth than that of the stomach. Of the means of modifying the conditions of the salivary glands extremely little was known.

Dr. Palmer described an instrument of his, wedge-shaped, well tempered, for cutting the roots of front teeth free from their attachments, in order to facilitate extraction. After carrying it two-thirds of the length of the tooth, between it and the alveolus, it is to be followed by an elevator,

flat on one side and rounded on the other, with which the root can then be readily displaced. In preparing a stump for pivoting, he filled the nerve canal with gold, and then the larger cavity with Wood's metal, and, at a subsequent sitting, drilled into that and inserted the pivot.

Dr. Morrison used thin beak forceps for extracting roots, with which he was generally successful.

A motion to postpone the hour of adjournment was carried.

The subject of Artificial Appliances was taken up for discussion.

Dr. Buckingham exhibited specimens of rubber, of various colors and compositions, prepared by Professor Wildman, of the Pennsylvania Dental College; also two sets of teeth, one on a base of pure rubber and sulphur, the other being of a preparation closely resembling the Company's rubber. Dr. B. did not consider the coloring in the Company's rubber at all deleterious. The other specimen, of a greenish color, was said to be tougher and stronger.

On motion of Dr. Palmer, the thanks of the Association were tendered to Professor Wildman for the exhibition of his specimens, and for his researches and experiments in reference to this subject.

Dr. Peebles called attention to impositions practiced in numerous places in the West, on members of the profession, by a pretended agent of the American Hard Rubber Company selling recipes for making rubber.

Dr. Buckingham, having some knowledge of the person, made an exposé of his character and antecedents.

Dr. Atkinson, by request, exhibited a number of beautiful preparations of sections of human teeth, which were seen through a powerful microscope. The exhibition was instructive as well as highly entertaining to all who were present.

The artificial palate of Dr. Kingsley employed the attention of the Convention for some time, various inquiries and statements being made by different members.

Adjourned to 3 o'clock P.M.

THIRD DAY.—*Afternoon Session.*

The Convention was called to order at 3 o'clock P.M., by the President. The minutes were read and approved.

On motion, a vote of thanks was passed to A. J. Wilson, Jr., Esq., for his courtesy to the members of the Convention during their stay at White Sulphur Springs.

No other business being presented, the President declared the Convention adjourned, to meet in the City of New York on the first Tuesday in August, 1866.

CONNECTICUT STATE DENTAL ASSOCIATION.

BY JAMES M'MANUS, D.D.S., HARTFORD.

THE semi-annual meeting of the CONNECTICUT STATE DENTAL ASSOCIATION was held in NEW LONDON, CONN., on Tuesday and Wednesday, Oct. 3d and 4th. Dr. A. Hill, of Norwalk, President, in the chair. The attendance was large, there being thirty active members present, and several distinguished members of the profession from neighboring States. The following were elected members of the Association :—

Active Members—Dr. W. W. Clapp, Norwich; Dr. Jas. Wordmance, Norwich; Dr. C. F. E. Blood, New London; Dr. J. H. Alexander, Mystic; Dr. W. H. Sharpe, Putnam.

Honorary Members—Prof. J. H. McQuillen, of Philadelphia; Dr. I. J. Wetherbee, of Boston; Dr. J. Chesebrough, Toledo, Ohio; Dr. F. Searle, Springfield, Mass.; Dr. L. D. Shepard, Salem, Mass.; J. M. Ney, Hartford, Conn.

On motion, the regular order of business was suspended to enable Dr. Wetherbee to present the claims of the PROTECTIVE UNION. This statement induced a number of those present to become members of the UNION.

The consideration of the treatment of irregularities was then opened by Dr. E. E. Crofoot, who presented models of a case which he had been treating. Dr. Shepard and Dr. Sage also presented models and detailed their mode of operating in such cases. Drs. Wetherbee, Sheffield, and Woolworth spoke at length on the subject. Dr. Atkinson favored the members with a sharp review of some of the points taken by those who had preceded him, and spoke at length on the various causes that result in an irregular *denture* and the means ordinarily taken to remedy such. In response to certain queries as to how certain cases should be treated, he remarked that it was impossible for any one, however extended his experience or successful his practice in this direction might be, to decide upon what would be the best course to pursue in a complicated case when his only acquaintance with the subject rested upon a description by another person. A rational and reliable opinion could only be given after a careful examination of the patient, or of accurate casts of the upper and lower teeth, showing their mode of articulation. With the exception of cases in which there may be vacant spaces posterior to the teeth, he said that it was impossible to move bicuspid and molars backward.

Dr. McQuillen followed in a very clear manner to illustrate the physiological laws governing the *development* and *growth* of the body. He directed attention particularly to the fact that the attainment of the normal size of the various parts of the organism was dependent largely upon the *use* that was made of them or the amount of *exercise* they obtained, and expressed surprise that although this was fully recognized by professional men so far as other portions of the economy was concerned, it was singular that its application to the growth of the jaws was almost

entirely overlooked. In the text-books, and in communications in the dental journals, writers constantly speak of the premature extraction of the deciduous teeth as objectionable on account of inducing *contraction* of the jaws and subsequent irregularity in the permanent teeth. He said that the irregularity was not so much attributable to *contraction*, as a failure on the part of the jaws to *grow to the normal size*, from the fact of not being sufficiently used. The absence of the deciduous teeth preventing due mastication of the food and proper exercise and growth of the jaws. In support of this position, reference was made to the large maxillæ presented by savages, and those in civilized life who live principally on coarse food which demands considerable chewing.

An evening session was held at 7½ o'clock, which was devoted to the examination of a large number of microscopical specimens of bone and teeth (human and comparative) presented by Drs. McQuillen and Atkinson. As both kindly brought with them, for the benefit of the members, powerful microscopes, all had ample time and opportunity to get clear and correct ideas of the structure of the teeth.

At 9 p.m. the members adjourned to the residence of Dr. Sheffield, where they were entertained in a most hospitable manner. After partaking of the good things provided for them, Dr. Hill returned thanks on behalf of those present, and expressed his gratification at again being present with them, alluding to the many advantages that the young practitioner has afforded him at the present day in contrast to the difficulties which those older in the profession experienced in their efforts for improvement.

Dr. Atkinson, after alluding in glowing terms to the kindness of the host and hostess, dwelt particularly upon the importance of a thorough training preparatory to entering upon practice, and referred to the advantages attendant upon a course of collegiate instruction in connection with intelligent and efficient private preceptorship, and very properly insisted that the day had arrived when the profession must take a decided stand in this matter.

Dr. McQuillen, in the course of some extended remarks, said that the truest and most efficient teachers were those who, believing that they had a mission to perform, merely regarded themselves, when surrounded by students, as *learners* standing among *learners*, a little in advance, it was true, and therefore prepared to assist and direct the efforts of beginners, but from the very fact of having made some progress in science, the more profoundly impressed with the vast field remaining to be explored and cultivated, and the utter impossibility of any single mind, however great, being able to grasp all. Science rested upon a basis formed by the labors of innumerable minds for ages. Thousands upon thousands of patient *observers* had recorded fact upon fact, which a few great *generalizing* minds, capable of recognizing the *exact* relation which one fact bears to other facts, had arranged in that orderly and methodical man-

ner which constitutes true science. As already remarked, this field was open to all, and one in which there was much still to discover and explain. It was a direction in which the dental student should labor, and endeavor at least to add something to his own specialty.

God had vouchsafed to us five senses as avenues to the brain, and through these, according as they are properly used or not, we acquire knowledge from every source, and if animated by a just appreciation of duty, gladly and freely impart all that may have been gained to others. It had been truly said that man is first an apprentice and then a workman, or first a scholar and then a teacher, and then a discoverer; for when one essays to *teach* he then really begins to *learn*, and often finds that much which he had accepted as true and reliable would not bear the test of the sharp scrutiny of an earnest and mature mind.

Wednesday morning, Clinics were given by Dr. McQuillen, and Dr. E. Strong of New Haven, from 8 to 10 A. M. Dr. McQuillen operated on the superior right first molar mesial and masticating surface, using sponge gold, and *hand pressure*. Dr. Strong operated on the superior left lateral incisor, restoring the shape, one-third of the tooth with adhesive foil and with the *mallet*.

The attendance at the Clinic was large, and all were pleased with the opportunity afforded by the gentlemen operating.

The Association was called to order at 10 $\frac{1}{2}$ A. M. After the preliminary business was dispatched, Dr. McQuillen delivered an oral lecture on the "MICROSCOPY OF THE DENTAL TISSUES," illustrating it with a series of large and finely-executed drawings of the microscopical appearance of the different parts of the dental organs.

After referring briefly to the typical form, number, and position of the teeth in the animal kingdom, the microscopical characteristics of the Enamel, Dentine, and Cementum in the human teeth were carefully and minutely described, and then contrasted with the structure of bone, and the peculiar relations which the enamel, dentine, and cementum bear to each other in the teeth of herbivorous animals, and by which, owing to the unequal wear of the different structures, the teeth present a constantly rough and triturating surface to the coarse food on which these animals subsist.

For an hour the attention of all was directed to this subject by the Professor, and it can be truly said that the opportunity afforded the evening before with the microscope, and the lecture and illustrations of the morning were such as are rarely given to many in the profession. As an Association, we were highly favored. Dr. Atkinson spoke at length on the same subject, and, at the conclusion, a hearty vote of thanks was given those gentlemen by the Association.

Afternoon session. The meeting was called to order at 2 $\frac{1}{2}$ o'clock. Dr. Atkinson read a paper entitled LIFE AND DEATH AND THE RENEWAL OF LIFE.

Dr. Jas. McManus read a paper on APPROXIMAL CAVITIES.

Dr. J. Woolworth, a paper on "WHAT CAUSES TEETH TO DECAY."

Dr. L. D. Shepard on PROFESSIONAL EDUCATION.

As these papers will no doubt be presented for publication in the DENTAL COSMOS, the reporter has not thought advisable to furnish a synopsis of them.

The treatment of teeth with exposed nerves was taken up and responded to by Drs. Atkinson, Hill, Sheffield, Hurd, and Metcalf. Adjourned 5 o'clock P.M.

The attendance and interest manifested was most gratifying, and we in Connecticut feel that our Association is one of the live institutions. "So may it be ever."

CENTRAL OHIO DENTAL ASSOCIATION.

BY A. W. MAXWELL.

THIS society was organized at Mansfield on the 5th day of September last. The following officers were elected: President, James Armstrong, Bucyrus; Vice-President, M. De Camp, Mansfield; Recording Secretary, A. W. Maxwell, Galion; Corresponding Secretary, H. J. Cressinger, Ashland; Treasurer, W. F. Semple, Fredericktown.

It was resolved to hold two regular meetings each year—on the second Tuesday in May, and the second Tuesday in November.

The meeting, though small in numbers, was characterized by a spirit of earnestness, and a determination that much good shall result from the organization of this association in the advancement of the interests of the profession in this part of the State.

The first semi-annual meeting will be held in Wooster on the 14th of November next.

By a vote of the society, a notice of the organization was ordered to be sent to the DENTAL COSMOS and the *Dental Register*.

MERRIMACK VALLEY DENTAL ASSOCIATION.

THE annual meeting of the Merrimack Valley Dental Association will be held in Phoenix Block, Concord, N. H., on Thursday, November 2, at 10 o'clock A.M.

It is proposed to continue the session two days.

The following subject has been assigned for discussion, viz., "Conservative Dentistry."

Dr. J. H. Kidder, of Lawrence, has been appointed essayist.

Prof. William H. Atkinson, of New York, has consented to be present and address the Association. It is also expected that Prof. J. H. McQuillen, of the Philadelphia Dental College, and other distinguished practitioners will be present.

You are earnestly requested to so arrange your business that you may be present, as it is our intention to have it not only a profitable but an enjoyable occasion.

G. A. GERRY, *Secretary*.

EDITORIAL.

SPONGE OR CRYSTAL GOLD.

ABOUT twelve years ago this article was first introduced to the profession as a material for filling teeth, but like many other valuable improvements in the arts and sciences it has been very slow in winning its way into the confidence of the profession generally, notwithstanding the fact that it has been used exclusively, and with perfectly satisfactory results, from that time to the present by some of our most skillful and experienced practitioners. Much of this is due doubtless to the objections urged against its use, a short time after its introduction, by certain parties in this city, who at that time had considerable influence with the profession. This, however, was not brought about by the mere expression of individual opinion, but mainly through the action of a committee appointed by a dental society to investigate the merits of the article in question, and which stated, in a report subsequently published, "that from all the knowledge they can gather from the experience of members of the profession, and also from the experience of the committee, they do not consider it advisable to recommend it to the profession as a reliable or safe material for filling teeth."

That the opinion thus emphatically offered was the honest conviction of the gentlemen composing the committee cannot for a moment be doubted, but subsequent events prove, however, that the experience upon which that opinion was based was entirely too limited to warrant such a sweeping denunciation of the article, for sponge gold has stood that test which tries all things good, bad, and indifferent—*time*, and has proved to be a reliable and safe material for filling teeth. Although the conclusion of the committee has been overturned through the variable results afforded by years of subsequent use of the article, there can be no question that the opinion advanced by the committee exercised a salutary influence upon the manufacturers, for some of the material furnished by them was admitted to have been imperfectly prepared, and it was with this mainly that the members of the committee had been experimenting. Two strong objections were urged at the time referred to against the material. One was the presence of mercury; this, however, had no foundation in fact. The other, and the more plausible objection, was the presence of muriatic acid, for nitro-muriatic acid is doubtless employed in the precipitation of the

gold into a spongy mass. This latter objection, however, is said to have been entirely removed by the treatment which the gold is subjected to before it leaves the hands of the manufacturers, who wash it with distilled water in glass tubes until the severest test proves that there is not the slightest evidence of acid in the water, and then after this a stream of water is passed through it for at least twenty-four hours.

The want of success in securing perfect adhesion of the particles of gold, which the committee complained of, was of course owing to imperfect manipulation, and which a more extended experience with the material would have readily overcome.

As a rule, it is a hard matter for men to rid themselves of decided preconceived opinions, and particularly if they have committed themselves, in verbal or written communications, either for or against any new movement or invention. Hence the force and truthfulness of Pope's remark that

"To observations which ourselves we make
We grow more partial for the observer's sake."

Few are willing, however, under such circumstances, to retract and admit that they have been mistaken. Yet any one who has at heart a sincere desire for truth and real advancement will never stand thus in his own light or that of others. Those who, therefore, are influenced by a strong feeling of prejudice against this article, should give it a fair trial and ascertain its real merits.

The writer of this does not wish to be understood as advocating the exclusive use of sponge gold, but rather as favoring an eclectic course, employing foil or sponge gold as the case may demand.

In filling front teeth, for instance, where there is little more than the enamel standing, and in cases where it is necessary to build out the operations so as to restore the general contour of the teeth, this article is peculiarly applicable. The same result, it is true, can be accomplished with foil, but not with the equal ease to the operator, or exemption from fracture of very thin and fragile walls of a cavity.

Depending, as the success of an operation does, upon the perfect union of particle with particle, it is a matter of the first importance that the points of the instruments should be in perfect order. The serrations should not be too *deep*, or the *points* too far apart, as this is calculated to leave the filling in a honey-comb condition, whether the material used be foil or sponge gold. The necessity of keeping the filling dry during the progress of the operation cannot be too deeply impressed upon the mind of operators, for the disintegration of sponge gold filling, complained of by good operators, has been mainly due to the presence of moisture from the breath or salivary glands. In conclusion, the same skill, dexterity, and care are demanded to secure a perfect result with this as with gold foil. In other words, it does not afford a safe harbor for inexperienced and incompetent manipulators.

BIBLIOGRAPHICAL.

TRANSACTIONS OF THE ODONTOLOGICAL SOCIETY FROM 1856 TO 1863 INCLUSIVE. Three volumes. London. Published by the Society.

As many of our readers are aware, the Odontological Society is an association of dentists, which was established in London for the purpose of elevating the standard of the dental profession in Great Britain. This was sought to be accomplished by an alliance with the College of Surgeons. Mr. Samuel Cartwright, the first President of the Society, in his address on taking the chair, said: "It is my opinion that any attempt to separate dental surgery from the profession of surgery, in reference to the future education of members of our profession, is impolitic in the extreme. By allying ourselves to the parent institution, the College of Surgeons, we must hold a proper position as professional men, while our status I think could not but be lowered by any scheme which involves a *voluntary* separation from that body." Another organization, the College of Dentists of England, was also formed about the same time, or a little anterior to it, whose object and aim was to establish a separate and distinct profession, independent of the College of Surgeons. For a number of years each of these associations continued in existence, accomplishing a great deal of work in the cause of dental education and advancement, but the different basis on which they proposed to operate, and the separate ends which they had in view, engendered a certain feeling of hostility toward each other, which was no doubt largely increased by a spirit of partisanship usually engendered under such circumstances. It is needless now to refer to the crimination and recrimination frequently indulged in by the writers of the two parties in the dental journals, as the difficulties have all been amicably adjusted by the union of the two societies under the name of the Odontological Society of Great Britain. The three volumes of transactions named above embrace the essays read before the Society, on various subjects relating to the science and art of the profession, prior to the union. Emanating as they do from men of liberal education and extended experience, they are all ably written, and many of them contain important and valuable suggestions. There is one feature of the Society, (which may be justly regarded as the *life* of all societies,) the discussions, that has been entirely left out of the Transactions. When recalling the elevated and instructive character of this portion of the proceedings as presented in the magazine, this omission cannot but be regarded as matter of regret to those who may desire to refer to what was said, by the members present, in commendation or condemnation of such and such views advanced in the essays.

Notwithstanding this drawback, these volumes are a very valuable addition to the literature of the profession, and the excellent illustrations which accompany most of the papers give an additional interest and value to them.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"The Food and the Teeth.—Observations on the Inorganic Constituents of the Food of Children, as connected with the Decay of the Teeth, and the Physical Constitution of Women in America.—[The following very valuable and instructive paper was read before the District Medical Society for the County of Mercer, N. J., some years ago, by the late JAMES PAUL, M.D., of Trenton. There is so much in it worthy the consideration of the profession and the public, that we deem it of sufficient importance to reproduce it.—ED. MED. AND SUR. REP.]

"The subject to which I have the pleasure of directing your attention is, not only in a physiological point of view, one of interest, but in its application to the preservation of health—the tendency to improve the general condition and physical constitution of the human family inhabiting this great continent—a continent abounding, as it does, in all the productions which a bountiful Creator, in his beneficence, bestows on man—cannot be otherwise than of great and paramount importance.

"At a period somewhat now remote, the celebrated naturalist, Buffon, alluding to the animals of this continent, advanced the following opinions:

"1st. That the animals common both to the Old and New Worlds are smaller in the latter.

"2d. That those belonging to the New are on a smaller scale.

"3d. That those which have been domesticated in both, have degenerated in America.

"4th. That, on the whole, it exhibits fewer species.

"These opinions, Mr. Jefferson, in his 'Notes on Virginia,' undertook, and it is generally considered successfully, to controvert; yet, however repugnant to the general idea the opinion as to the tendency of those animals which have been domesticated in America from other countries to degenerate, it is an undeniable and much to be regretted fact, that the human family, and more particularly the female portion of that family, have declined in the vigor and strength of their physical constitution.

"I wish not to be misunderstood: I say it is a melancholy fact, too well known to the observant physiologist, that increase of strength, and development of frame, have not been attained by the intermarrying of members of the human family of different nations on this continent; but the reverse is too observable: the physical frame of the female sex has degenerated—calling loudly for the aid of science to arrest an evil of so much magnitude.

"Let us for a moment contemplate the female form, as seen on this broad continent. In no country in the world are children more fair and beautiful; and as the young girl grows up to womanhood, we see in her a full realization of that being forming in the hands of Divinity, portrayed by the poet, as seen by Adam in his dream:

'Under his forming hands, a creature grew,
Manlike, but different sex; so lovely fair,
That what seemed fair in all the world, seemed now
Mean, or in her summed up, in her contained,
And in her looks;'

"We see this young and lovely being—the forehead well developed—the countenance, rather elongated, relieved of the harsher outline of some of the European nations—with fragile form, and small, yet well-developed bust, fitting for a few short years among us, and then—yes, then there comes a change. Ere five and twenty summers pass, this flower begins to fade—the rounded form shrinks—the bloom of health decays; and if she escapes the fell destroying angel's death-like grasp, a wreck of former self remains.

"Why should this be so? The robust of other countries come to this continent—they live in comfort—their food is excellent in quality—their progeny is like themselves—but even now, in the very first generation, does the degenerating process make itself manifest—the teeth begin to decay; and girls, while yet children, have to visit the dentist to have them cleansed, scraped, and plugged.

"Now this brings us at once to the head and front of our subject; and if we can point out the first cause of this decay of what should be as strong as adamant, it may be the means of helping us in our investigation. That there is something radically wrong in our system of rearing the young, to which this misfortune is in a great measure owing, I am free to confess is my firm opinion. I would indeed it were in my power, in pointing out the evil, to be as successful in detailing the cause, that we may apply the remedy. Still, although perhaps unable to accomplish all I wish, my observations may not be without their weight, and induce others, more observant, more scientific, and more competent to the task, to follow up an investigation so fraught with advantage to our fellow-beings.

"It is certainly to be deplored that the females of this continent, descendants of European parents, should be so much afflicted with caries of the teeth—the decay of parts formed of substances which enter into the composition of some of our hardest minerals—marble, bone-earth, and fluor-spar; and this decay unfortunately occurs in early life—in girls yet at school; and many a young woman, ere she has attained a marriageable age, has had to replace the natural with the unnatural, though more enduring enamel of the artist's formation. This ought not to be: God made all mankind alike; in no portion of the earth are nations found who lose their hands, or feet, or tongue, or eyes; and there can be no cause why the inhabitants of this land should lose their teeth. It is not so in the olden countries from whence the progenitors of the present race have come; nor is it so in the West India Islands, which may almost be considered as part of this great continent. So excellent is the structure of the teeth of savage nations, that some tribes in Africa, I think the Mocoos and Mundingoes, file all the front teeth, so that they shall be separated and form sharp points, the better to tear the uncooked animal food.

"One cause of this affliction is, in the mind of many, attributed to the great and sudden changes of temperature experienced on this continent—the thermometer rising and falling 20, 30, and even 40 degrees in twelve hours. But if attributable to these sudden changes, we know that sudden expansion by means of heat, or sudden contraction by means of cold, causes the particles of which bodies are composed to tear themselves asunder; consequently to crack, break, and fall in pieces. But this is not the case with the teeth of our females; a caries or decay commences most generally in the side of the tooth, extending to the enamel, which is some-

times involved in the destruction; at other times, it is left a crust or shell to snap and break off in small pieces, when unable to resist the pressure of whatever may be placed against it; besides, the teeth are for the most part sheltered from these sudden changes, and kept at a temperature nearly amounting to blood heat at all seasons. I do not think we can place the general destruction of the teeth, and consequent affliction of the females of America, to this cause. I fear we must rather look for it to constitutional weakness, and this constitutional weakness to a deficiency of the inorganic or earthy constituents being taken into the system, more particularly at an early period of life.

"If I am correct in this opinion, and reason, philosophy, and a thorough examination of physiological facts in both the animal and vegetable economy, tend far to bear out these views, then if we would try and correct this lamentable state of things, let us commence at the very beginning, and make ourselves acquainted by examining the structure and composition of the teeth, and then we shall be more able to understand what is required to aid nature in their formation and consequent preservation.

"First, then, let us make ourselves acquainted with the structure and composition of the teeth. The teeth are nearly allied to bone in structure; both having earthy deposits, intermixed with fibres and cells of gelatine, which, by consolidation, gives form and strength—in the case of bone, to bear the weight of the various parts, and afford protection to the different organs of the body; and in the case of teeth, to cut and grind the food required for the formation, support, and reparation of its various parts.

"Now, teeth are composed of three different substances, and these three are disposed according to the purposes required of them; they are, *cementum* or *crusta petrosa*, *dentine*, (known as ivory in the tusk of the elephant,) and *enamel*. The *cementum* or *crusta petrosa* corresponds in all especial particulars with bone; possessing its characteristic *lacunæ* or small cavities, and being traversed by vascular medullary canals, whenever it occurs of sufficient thickness; it is the first covering of the young teeth, and may be said to invest the fang of the tooth which enters the alveolar process of the jaw. The *dentine*, or ivory, consists of a firmer substance, in which inorganic or mineral matter predominates, though to a less degree than in *enamel*. It is traversed by a vast number of very fine cylindrical, branching, wavy tubuli, which commence at the pulp cavity, and radiate toward the surface. The diameter of these tubuli, at their largest part, averages about one 10,000th of an inch: their smallest are immeasurably fine; so much so, that they cannot possibly receive blood, but it is surmised that, like the canaliculi of bone, they imbibe fluid from the vascular lining of the pulp cavity, which aids in the nutrition of the tooth. The *enamel* is composed of solid prisms of fibres, about the one 5,600th of an inch in diameter, arranged side by side, and closely adherent to each other; their length corresponds with the thickness of the layer which they form; and the two surfaces of this layer present the ends of the prism, which are usually more or less hexagonal. In the perfect state, the enamel contains but an extremely minute quantity of animal matter. In the centre of the tooth is the soft pulp cavity, which affords a bed for the blood-vessels and nerves which supply it with life and sensibility.

"I shall not enter more minutely into the structure of the teeth, but

may briefly state, that like all other structures of the animal body, the component parts are derived and deposited from the blood, by that mysterious and incomprehensible power that selects and deposits the necessary constituents in the formation of the several portions, according to the use required.

"Now, in the composition of the teeth, we have first the division into organic and inorganic or earthy matter; and we find that the several substances which enter into the structure of the teeth, differ chiefly as to the earthy matter contained in each.

"Chemical analysis of the incisors, or front teeth of man, show that they contain in one hundred parts of each, as follows:—

	Cementum.	Dentine.	Enamel.
Organic Matter.....	29·27	28·70	3·59
Earthy Matter.....	70·73	71·30	96·41
	100·	100·	100·

"These proportions will occasionally differ; in some individuals the organic constituents having less than here stated, amounting in the dentine only to 21. The analysis of bone, however, gives a much larger proportion, viz.:—

Organic Matter.....	32·56
Earthy Matter.....	67·44
	100·

"Let us now take a more complete analysis, showing what earthy constituents enter into their composition. Analysis of the molar or grinding teeth of man, and of the bones of the arm and leg of a man of forty, show the following proportions:—

Inorganic Matter;	Dentine.	Enamel.	Bone.
Phosphate of Lime, with traces of Fluatoe of			
Lime.....	66·72	89·82	54·61
Carbonate of Lime.....	3·36	4·37	9·41
Phosphate of Magnesia.....	1·08	1·34	1·07
Salts, etc.....	·83	·88	2·35
Organic Matter.....	28·01	3·59	32·56
	100·	100·	100·

"Thus we see the very great proportion of certain earths that enter into the structure of the teeth and bone of man, the chief substance being the phosphate of lime, familiarly known as bone-earth. We find, too, that whereas in ordinary bone the phosphate of lime constitutes only 54 parts in 100, in the enamel of the teeth it is nearly 90 parts in 100—while the carbonate of lime in bone amounts to 9·41, in the enamel of teeth it is only 4·37; the enamel being literally almost a mineral in substance, having only 3·59 parts of animal matter in 100.

"Thus the teeth to be strong and durable, require a large quantity of earthy ingredients, particularly *lime*, to enter into their composition. Let us inquire whence it is derived; and for this we must examine the blood.

"To allow of such deposits from the blood, it is first necessary that they should be held in solution in that fluid. You are no doubt aware that the blood circulates to every portion of the body by the action of the heart, which forces a certain quantity, say two ounces, at every contraction, into the aorta or great canal leading from the left ventricle—that the aorta divides and subdivides into innumerable branches, which are

made to ramify to every part of the body, until the extreme branches end in capillary tubes or vessels, the calibre of which is so small as not to allow the red globules or corpuscles of the blood to enter them, but which allows the serous portion to traverse every part of the organized structure, holding in solution all those constituents necessary and requisite for the formation and reparation of its several parts.

"In the serous portion of the blood, then, we find contained the constituents required for the composition of bone and teeth—analysis of 1000 parts of healthy human blood giving, according to M. Lecanu, the following proportions:—

Water.....	780·15	785·58
Fibrine.....	2·10	3·57
Albumen.....	65·09	69·41
Coloring matter.....	133·00	119·63
Crystallizable fat.....	2·43	4·30
Fluid fat.....	1·31	2·27
Extractive matter, uncertain.....	1·79	1·92
Albumen in combination with Soda.....	1·26	2·01
Chlorides of Sodium and Potassium; Carbonates, Phosphates, and Sulphates of Potash and Soda	8·37	7·30
Carbonates of Lime and Magnesia; Phosphates of Lime, Magnesia, and Iron; Peroxide of Iron..	2·10	1·42
Loss.....	2·40	2·50
	<hr/> 1000·	<hr/> 1000·

"We see by this table, if we subtract or take away the proportion of water amounting to 780 parts, and the coloring matter amounting to 133, we shall leave scarcely 90 parts of organic and earthy material, the salts and earths forming upwards of a 10th—the salts being in proportion to the earths as 4 to 1.

"Having then shown the constituent portions of the bones and teeth to be in the blood, the next consideration is, whence are they derived?

"Before entering on this subject further, let us for a moment take a broader and more comprehensive view of what must be most interesting to mothers, and of great consequence to the well-being of the infant generation, in a short time, in a very few years, to become in their turn the mothers and fathers of another generation.

"The question then presents itself, what is the nourishment or food best adapted and necessary to the wants of an infant, that the foundation may be laid for a strong frame and vigorous constitution? For here, we must recollect, is the starting-point in by far the majority of instances. We know that in some cases disease is hereditary—that the offspring unfortunately inherits from the parents constitutional defects; but we also know that more misery, suffering, and constitutional derangement are entailed on children by want of care, and improper food in the first years of life, by which their hopes of health are blasted, and they are doomed to struggle through a weary life, to be hurried at last into a premature grave.

"Now, that the frame—that is, the bones, muscles, and other portions of the infant—may be fully developed, it is necessary that it should be supplied with nourishment, containing all the constituents required for this important undertaking. And this nourishment, by the all-wise ordering of Providence, is contained in the milk secreted from the mother's bosom.

"The infant is entirely dependent on the nourishment derived from its mother, and nature has wisely ordained that the secretion from the mother

is its very best food; for we find in the composition of milk—that is, healthy milk, derived from healthy blood—all those ingredients we have hitherto traced as requisite in the formation of the bones and teeth, and not only these, but every constituent required for the life and growth of the individual;—milk containing the albuminous, saccharine, oleaginous, saline, and earthy compounds requisite and necessary for the health, strength, and development of the infant child.

“How thankful ought we to be to the all-wise and bountiful Giver of all good, for this beneficent, this wonderful provision in nature, by which there shall be secreted from the mother a fluid so important, having properties blended in intimate connection, to afford the requisite substances for the support, growth, and development of her offspring.

“An analysis of cow’s milk gives the following proportions of the various constituents; that of human milk is not so elaborate, but contains the average of observations taken at fourteen different times from the same individual, by Simon.

COW’S MILK BY M. HAIDLEN.

Water.....	873.00
Butter.....	30.00
Caseine.....	48.20
Milk Sugar.....	43.90
Phosphate of Lime.....	2.31
Phosphate of Magnesia.....	.42
Phosphate of Iron.....	.07
Chloride of Potassium.....	1.44
Chloride of Sodium.....	.24
Soda in connection with Caseine.....	.42

1000.

WOMAN’S MILK BY SIMON.

Water.....	883.6
Butter.....	25.3
Caseine.....	34.3
Milk Sugar and Extractive Matter.....	48.2
Fixed Salts.....	2.3

1000.

	Maximum of 14 observations.	Minimum of 14 observations.
Butter.....	54.0	8.0
Caseine.....	45.2	10.6
Sugar and Extractive Matter.....	62.4	39.2
Salts.....	2.7	1.6

“Now although these amounts will no doubt vary, under every variety of circumstances, according to the *health, exercise, passions, and food* of the mother, yet they show what I particularly wish to impress on your minds, that healthy milk contains all the requisites for the nourishment of the infant—but then it must be *healthy* milk, secreted from healthy blood, and that blood must derive these ingredients from the *food* consumed, otherwise they will be taken up from the structures of the body, and hence the havoc made in nursing females when a due allowance of proper aliment is withheld, and the shrunken body of the famished mother is drained to the last drop, to supply the cravings of the death-like and impoverished offspring.

“I have said that the composition of milk in quality and quantity will vary and depend on circumstances. Now the mental state exerts a sur-

prising influence on this secretion, and much more than is usually supposed. It may not be irrelevant to mention a few of the cases recorded in our journals,* of the influence of strong mental excitement on this secretion.

"A carpenter fell into a quarrel with a soldier billeted in his house, and was set upon by the latter with his drawn sword. The wife of the carpenter, at first, trembled from fear and terror, and then suddenly threw herself furiously between the combatants, wrested the sword from the soldier's hand, broke it in pieces, and threw it away. During the tumult, some neighbors came in and separated the men. While in this state of strong excitement, the mother took up her child from the cradle, where it lay playing, and in the most perfect health, never having had a moment's illness; she gave it the breast, and in so doing sealed its fate. In a few minutes the infant left off sucking, became restless, panted, and sank dead upon its mother's bosom. The physician, who was instantly called in, found the child lying in the cradle, as if asleep, and with its features undisturbed; but all his resources were fruitless. It was irrevocably gone.

"A lady having several children, of which none had manifested any particular tendency to cerebral disease, and of which the youngest was a healthy infant a few months old, heard of the death of the infant child of a friend residing at a distance, with whom she had been on terms of close intimacy, and whose family had increased contemporaneously with her own. The circumstance naturally made a strong impression on her mind, and she dwelt upon it the more, perhaps, as she happened at that period to be separated from the rest of her family, and to be much alone with her babe. One morning, shortly after having nursed it, she laid it in its cradle, asleep, and apparently in perfect health; her attention was shortly attracted to it by a noise, and on going to the cradle she found her infant in a convulsion, which lasted for a few minutes, and left it dead.

"A mother had lost several children in early infancy from a convulsive disorder. One infant, however, survived the usual fatal period; but while nursing him one morning, she had been strongly dwelling on the fear of losing him also, although he appeared a very healthy child. In a few minutes after the infant had been transferred into the arms of the nurse, and while she was urging her mistress to take a more cheerful view, directing her attention to his thriving appearance, he was seized with a convulsion-fit, and died almost instantly.

"These are interesting cases, and tend to show the great influence the mental affections exert on the secretion of milk, in rendering it deleterious in quality, and unwholesome to the infant.

"Returning then to our subject, you will observe by the analysis that cow's milk differs from that of woman in the proportions of some of the constituents, that it abounds more in butter, but particularly in caseine, or cheese; and on the other hand, that human milk abounds more in the saccharine principle, or sugar of milk. Now this points out a circumstance from which great benefit may be derived. It is of very frequent occurrence that infants are deprived of the natural nourishment of the mother, and diverse opinions are given relative to the food of infants by persons who really know very little about the matter; one recommends a milk diet, another that the infant must be fed on starch and sugar.

"Now to enable the infant to receive a nourishment in every respect

* From Carpenter's Physiology.

similar to the mother, the knowledge of the various proportions which we obtain by chemical analysis, enables us to rectify and produce milk, very analogous to human milk, from that of the cow, by diluting it with water in the proportion of about half as much again; that is to a pint of milk should be added half a pint of water that has been boiled, which will reduce the cheese principle to the proper proportion; add a small portion of cream to restore the proportion of butter, and then add sugar until the whole is distinctly sweetened, and we have a compound in every respect similar to the milk from the human breast.

"To understand the subject of nutrition, allow me to explain to you that food should, or must embody two great principles; one to nourish, the other to give heat to the body. And food, when consumed, is applied to one or the other of these purposes. Now, in the process of digestion, the constituents of the food are separated, and arranged in three classes.

"1st. All that portion derived from animal food, eggs, the curd of milk, the gluten or adhesive portion of wheat and other grain, and whatever in animal or vegetable food can be rendered into *albumen*—of which the best example that can be offered in illustration is the *white of egg*, which is in reality nearly pure albumen—and the principle is therefore called *albuminous*.

"2d. All that portion of the food derived from vegetables, starch, sugar, etc., that can be converted into *sugar* in the process of digestion. This principle is, therefore, called *saccharine*.

"3d. All the fat, butter, oil, etc., which, when deprived of the other substances, is left in the state of *oil*, and therefore called *oleaginous*.

"Now, of these three the *albuminous* is the *nutrient*, and the *saccharine* and *oleaginous* the *calorific*, or heat-giving; and chemical analyses show that they vary in composition.

	ALBUMEN.		OLEAGINOUS.	
	Eggs.	Wheat.	Mutton Fat.	
Carbon.....	55.000	55.01	78.996	
Hydrogen.....	7.073	7.23	11.700	
Nitrogen.....	15.920	15.92		
Oxygen.....	22.007	21.84	9.304	
Sulphur.....				
Phosphorus.....				
	SACCHARINE.			
	Starch, Arrow-root.	Sugar from Starch.	Sugar of Milk.	Cane Sugar.
Carbon.....	44.40	37.29	40.00	42.301
Hydrogen.....	6.18	6.84	6.61	6.384
Oxygen.....	49.42	55.87	52.93	51.315

"You will observe that the albuminous or nutrient differs from the saccharine and oleaginous, in containing nitrogen, and sulphur and phosphorus, with carbon, hydrogen, and oxygen, while the latter contains only carbon, hydrogen, and oxygen—nitrogen being required in those compounds which give strength and formation to the frame.

"Now the albuminous, or nutritive, being that portion which affords nourishment to the body, contains those constituents required in the first place for the formation and giving strength to the different portions of the body, and when fully developed, of repairing the general waste continually going on in the system, whether from the usual wear and tear, fractured bones, or the ravages of disease. And the saccharine and

oleaginous—the calorific, or heat-making—to keep up a continual supply of fuel, as it were, that the body may be kept of a regular and proper temperature; for you are no doubt aware that there is a continual supply of carbon, or, in more simple language, of charcoal, required to keep up the natural temperature of the body; and what is not required for immediate use is stored away in the form of fat, to be called into action as occasion requires.

“We have seen in the analysis of milk, that that fluid contains butter, cheese, and sugar; consequently we can understand how an infant can thrive so well upon it—the cheese or caseine* of the milk, containing the nitrogenized or nutrient principle, which together with the earths and salts contained in the milk, goes to form the bones, muscles, and the different tissues of the body—the sugar, which we have seen by the analysis, contains a large quantity of carbon in its composition, going to keep up the temperature of the infant, while the butter, in the nature of fat, is stored away in a healthy infant, filling up every vacant interstice, causing a roundness and plumpness, the pride and joy of the happy parent.

“Now let us mark the difference of the babe that has been denied a milk diet, and is doomed by ignorance to be fed on starch and sugar. You will recollect that these two substances were composed of carbon, hydrogen, and oxygen only. By a process of digestion which I need not here enter into, such food is converted into sugar, the carbon of which becomes the fuel by which the temperature of the body is kept up—there being no principle in the food to give albumen, there is nothing taken into the stomach upon which the gastric fluid can expend its solvent powers; the infant is, therefore, much troubled with acid eructations, and the stomach becomes weak and irritable. The want of the nutritive constituent of the food, and the earths and salts, etc., necessary and essential for the formation of the bones and teeth, show a lamentable deficiency in the child’s development, and there being no fatty matter to be laid up the body is emaciated, the countenance is ghastly, the flesh and integuments hang soft and flabby over the bones, no absolute disease can be detected, the child is ravenous and hungry, and the unfortunate babe descends to the tomb a spectre and an object of the most pitiful description. This is no fancy sketch, but one too often met with in the ordinary walks of professional life. And why is it so? Simply because the composition of the human frame, the component parts of our food requisite to produce that frame, and the process of digestion and nutrition, are so little understood.”
—(*Med. and Surg. Reporter.*)

(To be continued.)

“*Influence of Calomel upon Dentition.* By DR. JULES CHAMPOUIL-
LON.—Calomel, so precious in the treatment of infantine diseases, gave me, three years ago, a result which I did not seek, but which struck me, on account of the advantages to be derived from its use in cases of diffi-

*	Analysis of Caseine from fresh milk.	Albuminous substances found
		in whey after coagulation with an acid.
Carbon.....	54.825	54.96
Hydrogen.....	7.153	7.15
Nitrogen.....	15.628	15.89
Oxygen.....	22.394	21.73
Sulphur.....		0.36

cult dentition.* Two months ago a case of the same kind again presented itself, and this time, observer, watchful, and warned, I was able to follow the action of the medicine step by step.

First Observation.—On September 17, 1862, the wife of a policeman brings me, at the Hospital of Tlemcen, Algeria, her little daughter, suffering from an abscess in the interior chamber of the right eye, consequent upon a blow received twelve days previously. The little patient, eleven months old, is of good constitution; she suffers but little from the eye. For the purpose of obtaining the reabsorption of the matter, I prescribe calomel, divided according to Law's system. Forty-eight hours after administering the first dose the abscess has diminished, but the child slobbers, and the submaxillary ganglions are painful and somewhat tumefied, especially on the left. I wish to ascertain the state of the mouth. The mother then informs me that her child on the day of her admission into the hospital only had the lower median incisors, and that subsequently, that very morning, the two upper incisors had appeared. The gums are hot, red, and swollen. I continue the calomel, limiting myself, however, to a packet morning and evening. Two days later (the 22d) the two lateral lower incisors have pierced the gum; the evening of the same day the left lateral incisor of the upper jaw shows itself in its turn. I then cease the calomel, for which I substitute a little chlorate of potash, notwithstanding the entreaties of the mother, who begs me to continue means 'for so easily cutting teeth.' The morning of the 23d the upper left eye tooth has pierced the gum; the abscess of the eye has diminished one-half. On the 29th the child quits the hospital, her mother alleging business. Eight days afterward I again saw the little patient. Her eye was quite in the same state; her gums were still red, but no other tooth had appeared. Thus, in four days, six teeth made eruption.

"Notwithstanding the idea of coincidence—which, for the first two teeth, I admit willingly—it seems to me difficult entirely to deprive the calomel of all participation in an evolution so rapid. The irregularity of the eruption, and, above all, its tendency toward one side, strengthens this opinion. Doubtless, the delay in the appearance of the teeth created conditions favorable to the evolution. I know, also, that the salivation ensued with a rapidity not usual with children; but may it not be ascribed to the fractional dose of the remedy? In refusing to continue the calomel, I was not unmindful of the danger there would have been in involving germs not having as yet attained maturity, even if it could be done. Of course, for a simple delay without accidents I should not advise the use of calomel sufficient to affect the gums; but, in cases of difficult dentition, I should demand of mercurial salt rather than of any other medicine an action which might also produce some benefit in another point of view. Verily, the medication is known. However, I cannot but think that in cases of serious accidents, of dangerous complications owing to difficult dentition, the administration of calomel actively pursued—more actively than is generally done—would produce a swelling and softening of the gums, which, by favoring the dental eruption, would counteract those accidents so rapid in their progress with children.

* Even if this agent produced the effect described, it would not justify its employment for the purpose, unless there should be so much constitutional derangement as to require its alterative influence to prevent injury to the system. Nevertheless the observation, if correct, may afford a useful hint for a similar application of other less objectionable agents.—Z.

"Second Observation.—On May 17, 1865, a mother brought me her child, twelve months old, having the right cornea clouded by extravasations of recent date. I examine the mouth. Of the two lower median incisors, one is through, the other ready to come through; the rest of the line of sockets does not announce a near evolution; no pain; no submaxillary swelling. The remedy is first administered on the 17th. On the 19th the child has taken twenty packets, containing altogether two grains of calomel. There has been no diarrhœa, but there is salivation. The gums are rather red and softened; not much ganglionic congestion. I cease the treatment on account of the state of the mouth and of the amelioration of the eye. That day the upper median incisors show themselves; then the morrow (the 20th) the upper lateral incisors; at length, on the 22d, a lower lateral incisor, on which side I did not note. Thus, five teeth have appeared in four days.

"Certainly, cases of spontaneous evolution as rapid as those cited are to be found. But it would be, at least, very curious that this rapidity should coincide with the four days' use of calomel, to cease so soon after, although the group cut remained incomplete and not symmetrical."—*(Med. Times and Gaz.)*

"Structure and Poison of the Rattlesnake.—Among a number of living reptiles placed at my disposal, for anatomical and physiological uses, were two quite large and beautiful Rattlesnakes, (*Crotalis durissimus*), with which I lost no time in making many experiments. The largest, a little more than four feet in length, and having fourteen rattles, was killed, and I made a dissection of its mouth, in order to learn some details of the anatomical relations of the fangs and poison apparatus. The two fangs in use, with the poison-sacs at their base, presented nothing remarkable, excepting that they were old and worn, and evidently soon to be shed. But directly behind these, the mucous membrane on each side was crowded with what might be called the fangs of reserve; for, like successive teeth elsewhere, they were ready for complete development in turn, as fast as those in use passed away. These were of all sizes, from near that of the fangs in use, down to the smallest germ, and I was able to easily count twelve on each side. Their developments, studied with the microscope, appeared as follows: First, a minute involution of the mucous membrane, (the tooth-follicle.) In this is seen a small conical papilla as the first trace of the future fang. This is gradually developed by the aggregation of cells, and when about 1-25th of an inch in length, its cavity (the pulp-cavity) is occupied with a net-work of blood-vessels. The growth after this is more rapid and determinate. The epithelial cells covering the apex of the papilla become lineally arranged, and, fusing together, form fibres, which, when filled with calcareous salts, constitute the intimate structure of the enamel. This enamel is formed very early, and some time before the appearance of the dentine or ivory: so that at one period you find simply the epithelial tooth-sac crowned with a point of enamel. As the tooth-sac increases and is pushed out, the enamel-point is more and more elongated, becoming finally very long and acicular, and with the sharpness well known in the perfect fang. Meanwhile the dentine, or ivory, is formed, and as this process is going on, its edges begin to roll toward each other on the convex and upper surface of the tooth. This rolling of the edges, to meet each other, continues gradually with the growth of the tooth; being first a

half, and usually at last a complete canal. This canal is the poison duct; and being thus formed, two results ensue: 1st. It is outside, and disconnected with the pulp-cavity, but communicates with the tooth-follicle at its base. 2d. It is only in the ivory substance, terminating externally at the point where this last connects with the enamel; the enamel-point, therefore, being free and solid. Thus formed, these fangs seem to be in waiting to replace the old ones in the event of their being removed, or naturally shed. How this replacement takes place I am unable to say from observation. But it appears to me that the original tooth-follicle becomes the poison-gland or sac; for several of the larger reserve-fangs had each a small sac, embracing its base, and which appeared to be only the primitive tooth-sac; and, moreover, the largest pair of these reserve-fangs lay directly behind the ones in use. The replacement might, therefore, occur as with the higher animals,—the pair of reserve passing gradually together with the poison-gland into the places of those removed. But however occurring, the substitution is exact and complete, and may take place in a very short time, for Dr. Dearing informed me, that from one of his captive specimens he extracted the fangs which were exactly replaced in six weeks; there are many facts tending to show that these fangs are naturally shed once in a while, if not regularly; at all events, their points are likely to be broken off by frequent use, and, however removed, Nature appears to have provided an ample stock in reserve for their almost indefinite replacement. The virulence of the poison of these animals is too well known for special description. I will only add, there is good reason for the belief that its action is the same upon all living things, vegetables as well as animals. It is even just as fatal to the snake itself as to other animals; for Dr. Dearing informed me that one of his specimens, after being irritated and annoyed in its cage, in moving suddenly, accidentally struck one of its fangs into its own body; it soon rolled over and died as any other animal would have done. Here, then, we have the remarkable, and, perhaps, unique physiological fact, of a liquid secreted directly from the blood, which proves deadly when introduced into the very source (the blood) from which it was derived! With the view of ascertaining the power and amount of this poison, Dr. Dearing performed the following experiment: The snake was a very large and vicious one, and very active at the time. He took eight half-grown chickens, and allowed the snake to strike at each under the wing as fast as they could be presented to him. The first died immediately; the second after a few minutes; the third after ten minutes; the fourth after more than an hour; the fifth after twelve hours; the sixth was sick and drooping for several days, but recovered; the seventh was only slightly affected, and the eighth not at all. With my second remaining specimen I was desirous of performing several experiments as to the action of this poison on the blood. The following is one: The snake was quite active, and as any one approached the cage, began to rattle violently; but twenty-five or thirty drops of chloroform being allowed to fall on his head, one slowly after the other, the sound of his rattle gradually died away, and in a few minutes he was wholly under the effects of this agent. He was then adroitly seized behind the jaws with the thumb and fore-finger, and dragged from the cage and allowed to partially resuscitate; in this state, a second person held his tail to prevent his coiling around the arm of the first, while a third opened his mouth, and with a pair of forceps pressed the fang upward, causing a flow of the

poison, which was received on the end of a scalpel. The snake was then returned into the cage. Blood was then extracted from a finger for microscopical examination. The smallest quantity of the poison being presented to the blood between the glasses, a change was immediately perceived—the corpuscles ceased to run and pile together, and remained stagnant without any special alteration of structure; the whole appearance was as though the vitality of the blood had been suddenly destroyed, exactly as in death from lightning. This agrees, also, with another experiment performed on a fowl where the whole mass of the blood appeared quite liquid, and having little coagulable power. The physiological action of this poison in animals is probably that of a most powerful sedative acting through the blood on the nervous centres. This is shown by the remarkable fact, that its full and complete antidotes are the most active stimulants; of these, alcohol, in some shape, is the first.—DR. W. J. BURNETT, *before the Boston Natural History Society*.—(From *Things Not Generally Known*.)

Paralysis of Arm from Dental Irritation.—The following details of an interesting case of this kind are recorded by DR. JOS. A. PETERS in the Proc. of the Buffalo Med. Ass. (*Buffalo Med. and Surg. Jour.*):—“Dr. Whitney related a case of partial paralysis of the arm consequent upon caries and exposure of the nerve of the lower dens sapientia of the right side. The patient was a thin, spare woman, about forty years of age, of decided nervous temperament—had had very little pain in the tooth, but for several weeks or months, considerable pain in the right side of the neck, extending to the shoulder and arm, with rigidity of the muscles, and, at times, immobility of the arm. On raising the hand to the face to locate the pain, it fell to her side. On coming in contact with the nerve in probing the tooth, the effect was more manifest in the arm than in the tooth, by painful twitching of the muscles, with an inability to raise it, so much so that she took hold of it with the other hand. He was now fully satisfied that the trouble in the arm, that had nearly deprived her of the use of the needle, and given her so much anxiety, and had been treated with fomentations, lotions, friction, etc., was referable to the condition of the tooth by *reflex* action. The usual mode of devitalizing and removing the pulp and filling the cavity entirely cured the other annoyances at once.”

Ptyalism of the Insane.—M. BERTHIER, of the Bourg Asylum, concludes a memoir upon this subject in these terms: Chronic ptyalism of the insane depends (1) Upon atony of the *primæ viæ*, and this should be combated by a substantial regimen; (2) Hallucinatory sensations, requiring moral agents in their treatment; and (3) Excessive general excitement, for which the sedatives and antispasmodics suitable to the mania are indicated. Of all these the last is the most obstinate, because it is inherent in the principal disease. The two first are easily treated with the aid of time.”—(*Gaz. des Hôp. and Dublin Med. Press.*)

Injection of Air into Foul Abscesses and Fistulæ.—PROFESSOR ROSER states that there is no better means of treating an abscess, the contents of which have become foul and stinking, than by the frequent injection of air by means of an elastic catheter and syringe. The patient is to be instructed to repeat this injection sufficiently often to prevent any accumu-

lation of pus; and this practice not only adds much to comfort by removing the nauseous smells, but also seems to greatly expedite the contraction and closure of the cavity of the abscess. It is of especial benefit in the treatment of the fistulous openings remaining after emphysema, and attended with such a disgusting smell. This is speedily removed by aid of the injections, and the healing of the fistula greatly promoted. This is often retarded for months, owing to the valvular condition of the track of the fistula preventing the free issue of the pus, which is secured by the daily passage of the catheter for the purpose of injecting the air."—(*Archiv der Heilkunde and Dublin Med. Press.*)

Odontoscope.—The Dublin correspondent of the *Med. Times and Gaz.* gives the following description of a new instrument: "Among the surgical instruments in the Exhibition which I have not as yet noticed is a 'Patent Dentiscope, Laryngoscope, Light-intensifying and Concentrating Apparatus, constructed for the purpose of illuminating the inside of the mouth with a concentrated and intensified light, for Dental or Surgical operations.' This instrument is the invention of Mr. Rahn, the eminent London dentist. The name given to it is another example of the barbarous mode of deriving words partly from the Latin and partly from the Greek language. 'Odontoscope' would not be much longer, and would not grate upon the ear as a mongrel production. It would be well, too, if Mr. Rahn had taken the trouble himself to revise the little pamphlet which is left in the Exhibition near the instrument, as its composition is calculated to give an unfavorable idea of the writer's knowledge of the structure of the English language. The following description is appended to the pamphlet in question:—

"The dentiscope consists of an optical arrangement of lenses in a cone and tube, with a rack and pinion-adjustment for focussing. This is mounted upon a plate, which moves in dovetails upon a larger plate, that forms a screen, with racks and pinions to raise and lower the optical arrangement at pleasure. The screen is jointed to a massive foot or stand, provided with a double-threaded tangent screw, with a bold milled-head nut for adjusting the screen to angles of elevation or depression. At the back of the screen, and upon the foot, or stand, is fitted a branch with pillar, carrying a Leslie's patent Argand gas-burner, with stop-cock and connecting piece, to which may be attached any length of India-rubber flexible gas-tubing to communicate with any gas supply on the premises, or provided in a portable India-rubber gas-bag, to be placed in a suitable and convenient place for the performance of the operation. The branch and pillar carrying the gas-burner is fitted also with racks, pinions, and milled-head nuts, to adjust the flame to the necessary distance and height required by the variable position at which the optical arrangement may be required at. The whole of this structure is fitted upon a circular plate, with centre cone or turntable; thus the instrument may be brought instantly into any position required."

"On the Prevention of the Oxidation of Metals.—Those familiar with the electrical science are well acquainted with the fact that zinc exercises positive relations with regard to most other metals. In other words, it possesses the power of keeping them in a negative state when in contact with them. In this negative state they are incapable of entering into combination with oxygen, and this circumstance may be applied with

much advantage to the prevention of the oxidation of machinery, especially such parts of it as, in the case of marine engines, are liable to come in contact with water. Many instances will at once suggest themselves, in which much manual labor might be saved by the simple contrivance of appending either a ring or a slip of zinc to the metal to be preserved bright. It would be especially applicable in the case of bayonets and rifle-barrels; and a zinc edging to a scabbard would prevent rusting of the sword."—(*Things Not Generally Known.*)

New Thermo-Electric Battery.—The *Sci. Amer.* says that "PROFESSOR WHEATSTONE has constructed a very powerful thermo-electric battery on the principle of that exhibited by Mr. Ladd at the Royal Institution. The battery constructed by Professor Wheatstone consists of sixty pairs of small bars, and its electro-motive force is said to be equal to that of two of Daniell's cells. The battery was recently exhibited to a select circle of Professor Wheatstone's friends, and it is stated that 'on connecting the terminals of this battery, excited as Marcus', a brilliant spark was obtained, and about half an inch of fine platinum wire when interposed was raised to incandescence and fused; water was decomposed, and a penny electro-plated with silver in a few seconds, while an electro-magnet was made to lift upwards of a hundred weight and a half. Bright sparks were obtained from the primary and secondary terminals of a Ruhmkorff's coil connected with the battery. In fact, all the effects obtained from a small voltaic combination were reproduced with ease by this thermo-electric battery.' In constructing this battery, Professor Wheatstone found confirmation of the curious fact, first announced by M. Marcus, that the power of a battery of this kind is very greatly increased by frequently remelting the alloys of which its elements are composed. This is supposed to be due to the repeated fusion breaking down the crystalline structure of the alloys.

"Not unnaturally, this thermo-electric battery is exciting the imaginations of men of science, causing them to call up wonderful visions of a future when much of the work of the world shall be done by *sunshine*. Thus a cotemporary suggests that 'like windmills, thermo-electric batteries might be erected all over the country—finally converting into mechanical force, and thus into money—gleams of sunshine, which would be to them as wind to the sails of a mill. What stores of fabulous wealth are, as far as our earth is concerned, constantly wasted by the non-retention of the solar rays poured on the Desert of Sahara. Nature here refuses to use her wonderful radiation-net, for we cannot cover the desert sands with trees, and man is left alone to try his skill in retaining solar energy. Hitherto helpless, we need not be so much longer, and the force of a Sahara sun may be carried through wires to Cairo, and thence irrigate the desert, or, possibly, if need be, it could pulsate under our streets, and be made to burn in Greenland.' A fascinating dream enough—and one which may prove to be 'not all a dream.'"

Cutting Hard Steel.—A correspondent of the *Sci. Amer.* gives the following practical information on this subject: "Seeing in your last number an article upon cutting hard steel with a soft iron disk rotating at a high velocity, and having had some experience in using the like, I send the

following: A few years ago I made a considerable quantity of gimblets, and finding the old way of cutting the screw by hand to be slow and hard upon the eyes, I constructed a machine to cut the screw with a sheet-iron disk, $3\frac{1}{2}$ inches in diameter, making about 3000 revolutions per minute. The disk was supported by plates $\frac{1}{2}$ an inch less in diameter than itself. I could with this machine cut from two to four dozen gimblets per hour."

Soft Soldering.—E. J. W., of Lenox, Mass., gives, in the *Sci. Amer.*, the following directions for this purpose: "As I have found old hands at the lathe entirely ignorant of the process of soft soldering, and as I have labored for years under the same disadvantage, it may interest some of your young subscribers to know how to attach two pieces of metal in a few seconds. This is effected by placing on each piece, with a leather or small brush, a small quantity of muriate of zinc, and then holding each piece over a spirit lamp—taking care not to inhale the former—and when it boils rub the plate with a thin stick of pure tin or solder; I prefer tin, which I melt in a ladle, throw out, with a jerk, on a metal or stone slab, so as to form a sheet when cold, and then cut into strips a little larger than an ordinary match; I, however, prefer drawing the tin into wire, of different thicknesses, and using it in that state. Any one can make the muriate of zinc by filling an ale glass one-third full with muriatic acid, and adding pieces of zinc (in the open air) until it will dissolve no more, then pour it off clear. As an experiment for the learner, let him heat a cent by a spirit lamp, placing a drop of muriate of zinc on it, and then rubbing a small quantity of tin on it, while the cent is held by a pair of pincers; then take a copper tack, dip the head in muriate of zinc, and place the head on the middle of the cent, which is still held by the pincers over the lamp; in an instant the head of the tack will become turned, and when both are cool press it with the foot into the floor. The first person who sees the cent on the floor will try to pick it up, and he will enjoy a laugh at the other's expense, and, at the same time, have taken the first lesson in soldering."

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Stimulants and Narcotics—Their Mutual Relations, with Special Researches on the Action of Alcohol, Ether, and Chloroform on the Vital Organism. By FRANCIS E. ANSTIE, M.D., M.R.C.P., Assistant Physician to Westminster Hospital, Lecturer on Materia Medica and Therapeutics to the School. Philadelphia: Lindsay & Blakiston, 1865.

The subject-matter of discussion in this book is of a highly important character, both in a theoretical and practical point of view. In it the author treats of the history, doctrine, and nature of stimulus, defines the character and describes the symptoms of narcosis, traces its relations with stimulation, reviews the bodily conditions unfavorable to its production, and records some experimental observations on the effects of prominent stimulant and sedative agents. He therein presents a large amount of historical, theoretical, and practical information, with a list of references to the authorities on these subjects, which will prove a valuable aid to the earnest student and practitioner of medicine. The work is issued in excellent style, with good paper, clear print, and neat binding.

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, DECEMBER, 1865.

No. 5.

ORIGINAL COMMUNICATIONS.

ARE YOU A READING MAN?

BY L. D. SHEPARD, D.D.S., SALEM.

Read before the Mass. Dental Society at Boston, Oct. 2d, 1865.

DURING the past two years, more than ever before, my attention has been directed to the subject of Professional Education.

Within this period we have witnessed great progress, much of which is undoubtedly due to the formation of so many local societies.

It is impossible for men to meet, month after month in these gymnasiums of thought, without acquiring new vigor and acumen. One of the first impressions which the new member receives is a consciousness that the field of research is broader than he supposed, and that he himself has only crossed its border. He begins to study and investigate, and a few months work a decided change in his views of the profession. That this is the natural result of associative effort is obvious. I will only mention as an illustration, that during the past winter three members of the Connecticut Valley Association, who had been in practice five, eight, and nine years respectively, closed their offices, attended lectures at one of our dental colleges, and took their degrees. One of these remarked to me, a few months since, that he had never ceased to regard it as the most important event of his professional life, that he was induced to attend our meeting at Greenfield, Mass., in January, 1864. His progress since that time has been rapid, and he attributes it all to the inspiration caught at our meetings. The same is true of the other two, and, in fact, of all the members. I have cited this case as an illustration of the results which such associations should exhibit everywhere. It is not an isolated case, and yet to me is one of great force, as it comes within the circle of my intimate knowledge, and is a result, to a certain extent, of my own earnest labors. This society, to which I have transferred a large share of my interest, undoubtedly displays to you all the same reviving spirit as a direct

result of its organization. The same is true all over the land, and yet, we feel, but a few sheaves have been gathered, while the great field remains unharvested. Maine and Rhode Island, as yet, have no societies; neither has New Hampshire or Vermont, although these two States have large representations in the Connecticut Valley and Merrimack Valley Associations. I can conceive of no reason why these States should be so far behind other States, except it be that no one has taken the initiatory steps. Experience has shown that all that is needed is for some active and judicious man to make the first move, and others will follow.

But I had another object in preparing this article, and have permitted the preceding remarks to open the subject, as they are so intimately connected with it. In fact, it is impossible to speak of one division of professional education without touching upon all. Our development must be *symmetrical*: *skill* must keep pace with *science*, and *integrity* *preside over all*.

There is one direction in which, I fear, our societies have failed to produce their proper results. Our meetings ought not only to make us better operators, and better informed from the observations and remarks thrown out, from month to month, but awaken in each mind a thirst for knowledge and a desire for *personal* investigation during our leisure hours.

Has this result been gained?

To answer this question, we must inquire in what ways this study must be prosecuted, and what means must be seized upon to gain this increase of knowledge.

Individual investigation is one of the most important. It must be a "habit" with us to make each case a study, particularly if any doubt of the result exists. To do this we must keep a case-book, in which the history shall be written of the first and each subsequent examination, with the course of treatment and reasons for the same. In this way we can learn, in time, *why we failed*. The use of the microscope is another. I would like to know how many microscopes are owned in this society, and how many of our number have never seen the Haversian canals, lacunæ, canaliculi of bone, the tubuli of dentine, the circulation of the blood, and the almost endless objects of interest which this wonderful instrument unfolds to view. But the easiest and most available means of keeping our minds active and enlarging the sphere of our information is the *scientific reading* of the day. To this point I desire to call your *particular attention*. I ask, seriously, as a profession, do we *read* enough? Are we up to the times, as a learned profession, in the great throes of thought, science, and progress which agitate the world? How many of us can converse on the great problems of the day throughout the world with anything more than the shallow commonplaces of ordinary life? Is this enough for a learned profession? Can the same be said of the mass of the clergy, the law,

and regular medicine? We will grant, for argument's sake, that this general erudition is not necessary for our daily duties. Furthermore, we will say that it is pardonable in a man whose early advantages were not great, and whose time is occupied in a laborious profession, if he is not thoroughly posted on general topics. On this point we may perhaps all agree. But where this same ignorance, and neglect to attempt its removal, is the general status of the profession on professional topics, are we not equally agreed to plead guilty, verily guilty?

Is there any excuse for our conduct, if this is the state of the profession to-day? Our scientific text-books are not numerous. How many of us have read them all? They contain errors, and many ideas behind the times, yet their general principles are correct and absolutely necessary for intelligent practice. But are there no recent publications, where we can find the new theories, with the exposure of errors, old and new? If so, can we turn our backs on these and claim to be educated men? The one grand curse upon our profession, from its beginning to the present day, has been the lamentable and very general ignorance of its members. Surely in this day of light, and progress, and general information, where the grand Christian doctrine, that "it is more blessed to give than to receive," is the rallying cry of every profession, and knowledge is almost as free as the air we breathe, what excuse can we render at the bar of public opinion if we, as a profession, are still groping our way in the dark ages?

A moment ago I spoke of the necessity of familiarity with the old text-books and the recent publications of the profession. Of course you all understand by the latter I refer to the dental magazines. You know what they are, their standing and the style of their articles. I desire to plead earnestly for their more extensive circulation. Foremost stand the *DENTAL COSMOS* and *Register of the West*—both able magazines and worthy of our patronage. From month to month I welcome their familiar faces. I take others, but regard these as best adapted for general circulation. There are a number of publications issued as a means of advertising certain institutions, patents, and manufactories, which have for the most part a gratuitous circulation. Some of these contain matter of interest and value, but for obvious reasons need no plea of mine.

Some may think that these magazines (*DENTAL COSMOS* and *Register*) do not come up to their standard, or are not conducted as such magazines should be. Who, I ask, but those very men are to blame for this? Is it any excuse for them to stand aloof, that what is does not not exactly accord with their notions? Or rather, are they not guilty, if, having decided ideas, they keep them to themselves and thus deprive the profession of their good counsels?

I regard the magazines as exponents of the profession, conducted by men of foresight and good judgment, as well as of liberal and elevated

views; they consult what is required by the profession, and publish what pieces of decent merit the profession at large furnish them with. Can we, entertaining such views, look with favor on men of talent who hide their talent in a napkin and keep it from the world? Can such condemn a magazine as not what it should be, when they have made no effort to change its tone? I know of no one among you who entertains such feelings as these; but I know of some who do, and whose course I must condemn.

Another reason why every dentist should be a subscriber to one magazine at least—more if he has the means—is the duty which he owes to the profession to contribute all he can to its elevation. If scientific publications are valuable—who doubts it at this day?—they must be sustained, and every lover of his profession must be an agent to elevate their standard and increase their circulation. “Why stand we here idle?”

I have spoken of our individual responsibility for the standing of the current literature of the profession, and of our duty to the profession to help sustain it, even if we do not read it or need its instructions. I now come to the practical question, whether duty to ourselves permits us to ignore this literature. What think you of a family where the newspaper does not make its daily or weekly visit? Is such generally regarded as intelligent? Do you regard them as fit companions with whom to pass a social evening? On the contrary, are they not always ignorant, superstitious, and narrow-minded? *In what differs an office without a professional paper?* I do not see how any operator can keep up with the times, and have his mind bright and active, unless he reads every month some professional writings which are fresh and practical. How many of you agree with me in theory? You may read things which are contrary to your experience. There is a chance you may be in error, that your observations may not have been as carefully made as those of others. Or the writer may be wrong, and do vast injury unless you correct the mistake. How many opportunities of good are lost, if you are remiss in your duty in this respect, can never be known. “Let your light so shine that men may see your good works.”

Does it not seem to you to be almost needless to argue this question, and do not you think I am over-excited and spending my breath for naught? I tell you, brothers, I know what I am talking about, and it is with sadness that I am compelled to speak thus earnestly.

To any one of you who takes none of the literature of the profession, let my words be addressed personally, and received kindly, as becomes brethren engaged in a common cause and inspired by a noble spirit.

You have no idea of the *necessity* of this appeal. Each one of you knows personally about himself. But I know how many copies are taken in New England, and who are the favored ones. You would be surprised if I should tell you how few, how very few, copies are taken in this city; and yet this city is not behind other portions of the land.

My position on the Committee on Dental Education of the American Dental Association has led me to study this subject with more than ordinary interest, and has furnished superior facilities.

Some of you may be aware of my interest in this subject. All, I trust, will give me credit for an honorable motive in making this appeal.

Well rewarded shall I be, if I can contribute in any way, and at any time, to elevate our profession, and place it higher still on the rolls of the noble and *learned* professions. And among the means of this elevation I think the one proposed is of no small importance.

Surely, I hope, the time is not far distant when it will no longer be said that only *one dentist in five* in our boasted New England is a subscriber to a professional magazine.

THE TUMORS OF THE MOUTH.*

BY JAS. E. GARRETSON, M.D.

(Continued from p. 185.)

IN 1861 the following very interesting case of odontocoele came under my observation. The patient desiring a set of artificial teeth, had about a year previous had extracted all the teeth of the upper jaw, and, as is customary, had been dismissed for a period of some four months, no desiring to wear a temporary denture. At the end of this time the impression of his mouth had been taken, the parts being in a good healthy condition. The teeth were made, placed in position, and worn with entire comfort for a period of several months.

About eight weeks before presenting himself to my notice, these artificial teeth were found to be getting loose, as if from some projection at the right border of the myrtiform fossa. Applying to his dentist, surprise was expressed at the occurrence, and advice given that the further progress of the case should be awaited. At this period the gums were more or less congested and were putting on quite an angry appearance; a few days later and a fistula formed. His dentist, confident that no portion of the roots of any of the teeth had been left in the alveolus, now dismissed the case, advising him to seek surgical assistance. In this condition he came under my observation.

The case presented the following features: much engorgement of all that portion of the gums and lips covering the incisive and canine fossæ, and which extended in a triangular direction to the inner canthus of the right eye, much soreness on pressure over all the affected parts, the fistula discharging thin, and occasionally bloody pus.

Examination with the probe gave the impression that it struck against the root of a tooth, and which would certainly have influenced the making

* This subject was presented some time back in the *Medical and Surgical Reporter*, but is now offered to the dental profession in a new and extended form.

up of the diagnosis if experience had not assured me that no tooth could, under ordinary circumstances, have had a fang extending such a length.

Deducing from the conditions present the imperative necessity for an operation, and the patient willingly acceding to the conclusion, the following course was pursued. The patient was etherized; an assistant, having sponge and water at his side, took charge of the lower jaw and lip. A second assistant steadied the head and held the superior lip well out of the way of the knife.

The parts being thus very fairly exposed, a pointed and somewhat delicate-bladed bistoury was passed through the superior fleshy boundary of the canine fossa to the inner canthus. To my surprise, it passed not only through the soft parts, but in the return cut sunk readily into the bone. A first flap was now dissected posteriorly from the dead mass: a second was bounded mesially by the nasal bone, ala, and left prominence of the myrtiform fossa. The blood being sponged away, I discovered, lying in the very centre of the carious bone, a cuspid tooth of ordinary size and development, the apex being in immediate relation with the floor of the orbit.

Now that this tumor had existed for a long time is not of course to be doubted, but it excited the attention of the patient only on the setting up of acute inflammatory action. This inflammation soon destroyed the integrity of the vault of the cyst; hence the softened carious state in which I found it. The interest associated with the case lies in the absence of all the teeth and the consequent loss of data for the diagnosis.

Osteo-dental tumors dependent on the development of supernumerary teeth are quite common; they are generally easily recognized from their position and size, being never larger than an ordinary pea, and mostly situated in some part of the palatine processes of the superior maxilla. Any obscurity, however, in these tumors is readily dispersed by thrusting a bistoury into them. The dental surgeon particularly would remark from the sense of touch whether or not the contents is tooth substance.

Osteo-dental tumors not unfrequently have as their contents undeveloped teeth. Only a few days back I saw a couple of bicuspid crowns, evidently long dead, which had been removed from one of these oral compound cysts.

Such osteo-dental tumors then, as just illustrated, may be viewed as the most simple of the compound cysts. Another class, the complex osteo-dental cyst, may now claim attention. No better illustration of this class of tumor can be found on record, perhaps, than in the memoir of the Guadelupe banker's son, by M. Forget, presented to the French Academy, and so ably and happily republished in English some years back by the publishers of this journal. As the illustrations are still in possession of the journal, the reader interested in the subject cannot do better than give them most attentive consideration, while certainly I cannot do better

than by using them. We preface by remarking, that by a complex osteo-dental tumor we mean a cyst containing some irregular complex mass, which common observation or the microscope reveals as being made up of irregular developments of dental tissues.

OBSERVATION 1.—*Osteo-Dental Tumor, size of a large Egg, encysted in the thick part of the Inferior Maxillary—Ulcerous Inflammation of the Parietes of the Cyst—Numerous Ossifluent Fistulæ—Resection of the left half of the Body of the Jaw and a portion of its Branch—Cured.*

Early in May a banker, of Guadelupe, introduced to M. Forget his son, whom he had brought to Paris with the intention of subjecting him to the necessary surgical operation for the remedy of a disease of the inferior maxilla, which had made its first appearance when the patient was five years old.

History of the Disease.—At that period (five years), young L. suffered from pains in his left jaw; they were for some time intermittent, then continuous and acute. When the patient was seven years of age, two small healthy molars were extracted, under the impression that they were preventing the evolution of the second teeth. The operation gave great relief, and the pain ceased; but shortly afterward a small, round, hard tumor appeared on the external face of the jaw, near the alveoli of the teeth that had been removed. The tumor caused no suffering to the patient, and made no sensible progress for a period of eight years. The whole of the left side of the jaw then became tumefied, and the bone, in the language of the patient, broadened and rounded. He also observed, at this time, that the large molars, which were regularly developed on the right side, were wanting in the diseased part.

This morbid enlargement was accompanied by frequent fluxions of the gums, cheek, and whole left side of the face. The recurrence of this fluxion was attended with great pain, and caused an increased tumefaction in the soft parts to such an extent that the difference between the sides of the face became absolute deformity.

In November, 1854, a violent inflammation occurred in the base of the jaw and the cervico-maxillary region. Antiphlogistic treatment was employed, two applications of leeches were made, and the inflammatory symptoms decreased, and, fifteen days afterward, purulent matter formed in the thick part of the cheek, which opened spontaneously, allowing the issue of a large quantity of fetid pus. The opening of this abscess became fistulous, the surrounding tissue then detached, and, under them, the bone was naked for a very considerable extent.

Present Condition.—Young L., aged twenty, strong, well developed, with an excellent constitution, and health perfect in all respects, excepting the local affection.

The disease appears externally in a considerable tumefaction of the

left cheek, which is more than three times its natural size, and the tumor has caused a very marked eccentric development to the corresponding maxillary bone.

When the patient opens his mouth, which he does without effort, the whole left side of the bone was seen to resemble a large turkey-egg—the base of the jaw being confounded, without appreciable line of demarkation, with the internal and external faces, which describe a very considerable curve.

The tumor is uniform, without depressions or any irregular swellings upon the surface. It does not yield to pressure, and no part of it gives that sound of crepitation which is characteristic of attenuation of the osseous tissues. The external swelling hides the superior and lateral part of the neck; the enlargement of the bone has forced the tongue from its true direction, and the floor of the mouth has been driven from the left to the right.

The alveolar ridge, singularly enlarged, contains none of the grinding teeth, except the first bicuspid, which stands regularly in its socket. The tissue of the gums is dark-red, and unusually thick and hard. In a circumscribed spot, about the size of a twenty-centime piece, the tissue is broken, and exhibits an unequal, wrinkled, grayish surface, which gives a dry sound when struck with a metal, as if the crown of a tooth were hidden in the cavity.

In order to complete the symptomatic description, it is added that there are many ossifluent fistulous openings at the base of the tumor, and much hypertrophy and hardening of the submaxillary lymphatic ganglion.

The functional disorders arising from the pathological condition, at first very slight, are noticed at this stage as increasing every day: embarrassment of vocal utterance, mastication painful and incomplete, deglutition effected with difficulty, and respiration very difficult every time inflammation is renewed in the tumor; lastly, the patient suffering from two serious inconveniences—one, the very marked deformity of the face; the other, the incessant flow of fetid pus, proceeding from the complicated fistulæ of the osteo-dental caries.

M. Forget here describes the operation, the usual resection with which it is presumed all are familiar. One incident, however, should be remarked: in making his anterior cut with the chain-saw, he alludes to coming in contact with a tooth placed horizontally in the thick part of the bone, precisely under the alveolus through which he was cutting.

Anatomical Examination of Tumor.—With the surrounding soft parts, it is described as being an exact ovoid. The soft parts, adhering to its external face, were found marked with many fistular passages, ending at inflamed and ulcerous points of osseous tissue. This tissue was thin, soft, and depressable, and perforated by two orifices leading into

the interior of the cyst, from which exuded a purulent, viscid, reddish liquid. A stylet introduced into one of these passages was stopped by a hard body, which, under percussion, sounded like a compact tissue deprived of its periosteum. This object was reached by dissecting off the gums, which, condensed into a thick bed, formed a sort of operculum for the upper part, completing the cyst in which the morbid product was situated. The dissection exhibited that the jaw from the ramus to the premolar had been changed into a cavity containing a compact, saxa-form, ovoid mass, the size of a large egg, grayish, unequal surface, studded with small tubercles, surrounded by a bed of enamel, and completely buried in the thick part of the bone. See Fig. 1.



Next, the tumor was divided along its axis into two unequal parts, each confined to the corresponding half of the osseous cyst that was comprised in the division. This revealed the composition of the tumor: it was formed of a smooth, glossy, compact, homogeneous, ivory-like tissue, of a whitish-brown color. In the centre of it, a kind of regular disposition of its elements is described as existing, discernible by the naked eye. See Figs. 2 and 3.

Between the tumor and the wall of the cyst was a thick, fibro-cellular tissue, free on the side of the former, where it covered the whole intra-maxillary portion, and was joined to the latter by filamental prolonga-

tions of a cellulo-vascular appearance—these being attached to the numerous openings that covered the face of the cyst. The external sur-

Fig. 2



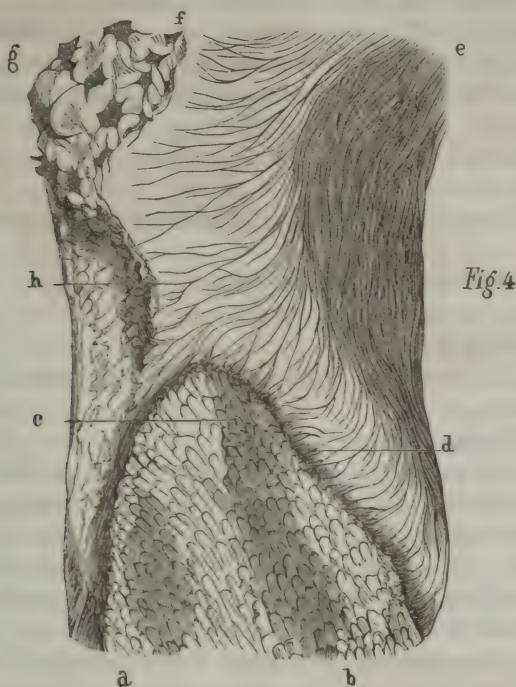
face of this membrane was bathed with a muco-purulent liquid, smelling like dental caries.

Fig. 3



At the base and anterior extremity of the tumor, an indentation is described fitting the crown of a large molar that stood between it and the maxillary bone. (See Fig. 3, *b*.) A portion of the same tooth caused

a slight elevation on the external face of the jaw. (Fig. 2, *e*.) M. Forget also describes the tooth encountered in the operation. (Fig. 2, *d*.) Its location, as will be seen, is directly beneath the alveolus of the first molar, which is standing in its true position. (Fig. 2, *e*.)



All the teeth, with the exception of the last two molars, it will thus be seen, were found, and the space appropriated for them was filled by the tumor. What then, queried M. Forget, could have become of these two great molars? It could not be, he argued, that the bulbs, compressed from their very origin, had disappeared without leaving a single vestige of their existence. The numerous instances, he held, that had occurred of the simultaneous development of teeth and anomalous productions in the very centre of the maxillary would not allow him to think of accepting such an explanation. In all the analogous cases that had fallen under his observation, the teeth were of the ordinary dimensions, and complete in number, although removed from their normal position, and sometimes buried even in the morbid substance itself.

Let us now, that we may fully comprehend such a class of cases, pursue the study of this particular one.

Fig. 1 represents the left half of the body of the inferior maxillary, hollowed into a large cavity, containing an ivory-like, bony tumor.

d. Side view of the alveolar edge.

a. Orifice of the dental canal upon the surface of the resection of the bone in the continuity of the ramus.

b. Plane of the cut in front, showing the second small molar which was found in it.

e. Crown of the first molar, in regular position.

Figs. 2 and 3. The two halves of the anatomic section, divided according to its axis (osseous cyst, and included tumor).

Fig. 2.—*c.* Crown of great molar, seen through a notch in the outer wall of the cyst.

d. Second small molar.

e. First small molar.

a and *b.* Points of the same wall, perforated by the prolongation of the tumor.

f. Summit of the most elevated of these.

Fig. 3.—*a.* Interior aspect of the tumor.

b. Great molar inverted.

c and *d.* Cellulo-fibrous membrane, interposed between the osseous cyst and tumor.

Fig. 4. Microscopical examination.

M. Forget, in presenting this case to the French Academy, remarked that it was a duality of anatomical and pathological lesion, so rare, that after the strictest research, he was led to believe it unexampled in the human species. Thus then we have here, side by side, each extreme, and understanding each, there is not likely to come anything between that we may not be able readily to explain.

A dental germ assuming, or compelled to an abnormal position, may have various sequelæ. It may make a maleruption; it may remain encysted; it may die after partial development, or it may heterogeneously develop.

We have then but to consider heterogeneous development, and we have mastered the pathology of the lesion, and all its various phases.

(To be continued.)

MANIPULATION OF HARD RUBBER IN THE MANUFACTURE OF ARTIFICIAL TEETH.

BY THOS. H. CHANDLER, BOSTON, MASS.

HAVING seen at various times instructions, intended to be complete, for the manipulation of hard rubber in the manufacture of artificial teeth, none of which seemed to tell the whole story, I herewith add my mite. The point on which the most stress has been laid is the packing of joints, and the ways and means of keeping the rubber out. Some have recommended to bevel the joint on the inside in order to obtain

room for plaster, tin, and what not. This is wholly wrong and fit only for such as cannot or will not take the pains to make a good joint. The blocks should be ground up as nicely as it is possible for the grinder to make them, and left to harden in the plaster at least over night. I usually contrive to get them into the flasks the last thing in the afternoon and pack the first thing in the morning. If the plaster is green it will certainly yield, and unsightly work is the result. Care must also be taken in putting the wax on to the case not to daub it all over the joints outside, or let it run into them on the inside. Leave the joints clean so that when the plaster is poured around the case it will run in and fill up all faulty places. This is the best packing possible. Again, care must be taken to leave free exit for the surplus rubber where the ordinary flasks are in use. Those who use Howell's packer should of course follow his directions; but for Whitney's and similar flasks, my method is as follows: After separating the two halves of the flask, on either half, generally on the male, I remove about a thirty-second of an inch of plaster from the whole surface outside of the case where the two plasters touch when the halves are together. The reason for so doing is that when the case is full and the rubber is overflowing it is apt to run out of the ordinary grooves and fill the whole space between the two halves, thus preventing them from coming together without the exercise of considerable force, separating joints, breaking blocks, and mischief generally. Where the plasters do not touch, this cannot well happen. Besides this thirty-second of an inch I always cut the ordinary grooves, and also take out a triangular piece on the outside edge by passing a knife all around, so that by no possibility can there be any straining outward pressure upon the teeth after the case is full. I use McDermutt's flasks in preference to any other, but will not recommend them to any man who is not willing to take extra pains, and to him who is not, all this would be as well not written. Howell's packer and flasks I place next.

For making air-chambers in upper sets the best material is block tin rolled down to the required thickness, say about No. 19, U. S. Gauge. It makes a sharp, well-defined edge, and leaves the case clean and polished. Take a piece of stiff paper, double it (when doubled we get both sides alike), and cut out the proper form with scissors, trying it on to the case till it fits. Then lay this pattern on the tin, and with a sharp point mark out and cut with shears. Now how shall we get this upon our model without marring it? Take it in the pliers and warm it carefully, so as not to melt it, over a spirit or gas flame till it begins to bend by its own weight; then place it quickly upon your model where you want it, and with a rounded piece of wood press it down; it will yield like wax. Don't be too particular about getting it to fit at every point, for in vulcanizing it will be softened, and the pressure of the rubber will

bring it home so closely that the marks of the plaster model will be seen on the back side of it. Therefore care must be taken in fastening the "cavity" into its place, to put the pins in where it certainly bears, generally near the edge, or else the tin will be pushed away from them, they will be left projecting, and there is a hole through your case. In taking the tin out of the chamber, care must again be taken not to break down the edge by prying against it. Put your chisel through the tin, and gradually get the point under. The tin will bend up in the middle, draw away from the sides, and come out clean. It can be remelted and rolled over and over again, although it gets harder by the process. A light line drawn around the edge of the tin in the plaster helps the chamber to take hold in bad cases, and is easily enough cut off if found to hurt.

In taking the cases out of the flasks after vulcanizing, many a one has bought his experience dear by "breaking things" in prying them out. Always cut them clear of the edges all around before beginning any prying, and then go in with fear and trembling. McDermutt's flasks have this advantage over others, that both top and bottom are removable, and a case can be cut clear out without any strain. In vulcanizing, never let the mercury rise quite to 320° if you want a good color. Keep it at about 315° for an hour and a quarter. Too much heat changes the color of the sulphur, giving it a brown hue in place of its ordinary bright yellow, besides making the rubber brittle. Too much care cannot be taken to get every particle of wax out of the flasks before putting the rubber into them; and here we must go back to the original impression from the mouth. It is customary, in order to remove the model from the impression, to soften the wax by warming it over a gas or other flame, thus often melting the wax into the plaster. When this is done, it is impossible to remove it; it gets into the rubber, makes it soft and brittle, so that it will not take a good polish, and will not bear the test of wear. Any one who doubts this can easily prove it for himself by letting some of the wax remain in the flask around the teeth. On removing the case from the vulcanizer, he will find a line of lighter red just there which is softer and more porous than the rest. To remove the model from the wax, warm some water to rather more than blood heat, put the two together into it and leave them awhile. They will then separate easily, no teeth broken off and no wax in the plaster. After separating the flasks and removing as much of the wax as comes away easily (by-the-way, I always warm my flasks in water before taking them apart), heat some water to *boiling*, a quart or more; put the flasks into the sink, and then pour the boiling water upon them from two feet or more above in a slow stream. The dashing hot water will penetrate every cranny of the case and wash out every particle of the wax, suffering none to be absorbed by the plaster. Hot water also plays an important part in softening the

rubber preparatory to packing. Take a shallow tin plate with a shallower one fitting into it. Fill the former with *boiling* water, and place it over a flame where it will retain its temperature, cut your rubber into suitable strips and lay them around on the other plate. Place the second upon the first and let the hot water do its work. In this way the rubber is kept at an even heat and the right one for use, with no danger of burning.

After the flasks are packed, instead of heating them over a flame, with danger of burning your rubber, as is common, in order to bring the parts together, again put them into boiling water and let them thoroughly boil until inside and out they are heated alike; then take them out and screw down carefully. You will find no difficulty in doing it at once.

For polishing, use common bristle brush wheels with pumice, rotten-stone, and whiting about as for gold, taking care not to get the rotten-stone, etc. into the clean joints, and make them look as badly as the rubber would. To avoid this, before beginning to polish, and after every washing, rub the blocks well over with brown or other plastic soap, especially rubbing it well into the joints; then, when washed, soap and dirt will go together.

Much difficulty seems to be experienced in the case of partial sets, as the flasks sometimes obstinately refuse to come together, and leave the teeth standing off from the gum. In such cases the teeth never should be removed from the model after they have been ground into their places. This is difficult with the ordinary flasks, but perfectly easy with McDermutt's. The model should be put into the flask with teeth all on it, just as they were ground, and covered, teeth and all, except the wax, with plaster. Then after making the opposing half as usual and removing it, we have the case facing us in the opposite of the usual position, with the teeth crowns upward and covered with plaster. After removing the wax and gutta-percha the teeth remain in the plaster on the model just where they were originally placed, and the case is packed from the front side. In this way there is not the same necessity for care in cutting gutters or bringing the flask together, since what superfluity of rubber there is will be on the oral surface, and therefore harmless. Too much force, however, will break teeth in this way as in the other: it is wise therefore to stop screwing when we perceive by the force required that the case is full. I have used this method for three years, and in that time have not had a single failure from the difficulty specified.

My communication has drawn out considerably more than I had anticipated; but if my pains by your means shall ease one suffering soul, I shall feel amply paid.

EXEMPTIONS FROM MILITARY SERVICE ON ACCOUNT OF LOSS OF TEETH.

BY JOHN R. LEWIS, M.D., D.D.S., COLONEL IN THE VETERAN RESERVE CORPS, U.S.V.

WHILE in Washington I received of my friend, Surgeon J. H. Baxter, a copy of his report to the Provost Marshal General for 1864. I have recently found time to compile from it some very interesting statistics pertaining to the profession.

The war, with its gigantic movements and changes, has enlightened us on very many subjects, and it will be noticed is not altogether silent on that in which we are professionally most interested. The facts thus brought to light are demonstrated on such a magnificent scale as to establish them beyond a peradventure. We must of course take into consideration that these facts are established entirely by examinations of males, but the experience of the profession may well determine their importance as applied to both sexes.

Table No. 1 gives the relative condition of the teeth in different localities as shown by the examinations in the different States, and in this respect affording cause for speculation and reflection in the wide difference in condition found to exist. Table No. 2 is of similar import, showing the same or nearly the same condition to exist in the draft of 1864, and nearly the same relative differences. The total of draft in 1863 and 1864 show a most remarkable fact in the enormously large number of exemptions from loss of teeth; being in 1863 very nearly one-fifteenth of all exemptions, and in 1864 nearly one-tenth. These facts are made more appalling, however, by the facts made apparent by the comparisons in Table No. 3, where it appears that although the ratio of the whole number of exemptions is much larger in Great Britain than in the United States, the exemptions from this one cause are little more than half as great. And the difference is still more manifest in France as demonstrated by the very large numbers examined. But more marvelous still is the condition of the teeth in Belgium, as shown by the table, where we find the exemptions to be nearly eighty times as great from this cause in the United States as it is in Belgium.

By Table No. 4, it will be seen that this condition of the teeth in this country, as compared with Europe, bears no relation to other causes of exemption, or at least to many of them. This table demonstrates some other very important facts. First, that diseases of internal organs, as disease of the brain, spinal cord, heart, and lungs, consumption, etc., are in a ratio nearly corresponding to the condition of the teeth. And, second, that those causes for exemption which arise from overcrowding, bad ventilation, poor and insufficient food, and hard work, such as feeble constitution, deformity and deficient size of chest, and curvature of spine, scrofula, and syphilis, disease of the skin, hemorrhoids, etc., are in an

inverse degree in Europe as compared with the condition of the teeth. It would be very interesting to me to trace these differences still further, and also to speculate upon their cause, but I must leave it to others who may devote more time to it, hoping and believing that such facts will produce some effect upon the teaching and practice of the profession, looking toward a correction of this lamentable condition of the teeth of the people of this country.

TABLE I.—*Showing Number Examined, Number Exempted, and Ratio per Thousand of Exemptions from "Loss of Teeth," in each State in Draft of 1863.*

	Number Examined.	Number Exempt.	Ratio per 1000.
Maine.....	14,305	146	10.21
New Hampshire.....	7,375	170	23.05
Vermont.....	6,719	140	20.84
Massachusetts.....	29,028	969	33.38
Rhode Island.....	4,097	92	22.46
Connecticut.....	10,818	287	26.53
South Division, New York.....	24,627	295	11.98
North Division, New York.....	27,658	385	13.92
West Division, New York.....	29,759	1,068	35.89
East Division, Pennsylvania.....	36,294	623	17.17
West Division, Pennsylvania.....	35,607	798	22.41
Delaware.....	2,175	19	8.74
Maryland.....	4,821	45	9.33
District of Columbia.....	4,290	59	13.75
Wisconsin.....	12,237	66	5.39
Michigan.....	5,379	68	12.64
Total.....	255,188	5,230	20.49

TABLE II.—*Showing Number of Men Examined, and Ratio per Thousand, and Number Exempted for "Loss of Teeth," in each State in Draft of 1864.*

	Number Examined.	Number Exempt.	Ratio per 1000.
New Hampshire.....	1,441	39	27.06
Vermont.....	197	4	20.30
Massachusetts.....	6,689	270	40.36
New York.....	6,630	229	34.54
New Jersey.....	7,728	156	20.19
Pennsylvania.....	10,941	346	31.62
Delaware.....	1,692	11	6.50
Maryland.....	7,686	183	23.81
Minnesota.....	3,125	69	22.08
Kentucky.....	4,461	49	10.98
Ohio.....	10,229	193	18.87
Michigan.....	368	5	13.59
Total.....	61,257	1,554	25.37

TABLE III.—*Showing the Ratio of Exemptions from Military Service for Mental and Physical Infirmities in the United States, Great Britain, France, and Belgium.*

	Number Examined.	Number Exempted.	Ratio per 1000.	Number Ex-empt for loss of Teeth.	Ratio per 1000.
United States—Draft of 1863.	255,188	80,134	314.02	5,230	20.49
United States—Draft of 1864.	61,257	15,744	257.02	1,554	25.37
Great Britain, April 1st, 1842, to March 31st, 1852.....	171,276	57,381	335.	2,298	13.4
France, 1831 to '43 inclusive..	2,097,876	680,560	324.40	17,709	8.5
Belgium, 1851 to 1855.....	201,790	64,696	320.62	52	.26

TABLE IV.—*Showing Ratios of Rejections for Certain Diseases and Infirmities, in United States, Great Britain, France, and Belgium.*

CAUSES OF REJECTION.	Ratio rejected per 1000 examined.				
	United States.	Great Britain.		France.	
	1863.	1860.	1861.	1831 to 1843.	1851 to 1855.
Imbecility	3.88	2.20	.50	.....	1.69
Epilepsy	8.39	.....	.....	1.9	.94
Disease of brain, spinal cord, heart, and lungs	45.35	15.36	27.27	.....	.....
Consumption.....	15.00	2.26	5.00	.....	.....
Feeble constitution, deformity, and deficient size of chest, and curvature of spine..	44.29	57.03	97.45	94.8	19.08
Scrofula and syphilis.....	5.16	21.13	28.52	.....	10.5
Disease of the skin.....	1.92	5.54	8.63	12.51	6.34
Disease of the eye (myopia included).....	19.97	28.75	28.52	20.00	13.08
Disease of the ears and deafness.....	7.13	3.10	4.51	.....	1.68
Disease of the nose and mouth.....	.51	.77	1.63	.....	.....
Stammering.....	1.76	1.31	1.63	.....	.....
Loss of teeth.	20.49	9.52	7.76	8.5	.26
Hernia.....	30.93	11.79	14.89	24.5	3.99
Hemorrhoids.....	3.59	5.00	5.88	.....	.....
Varicose veins.....	7.63	28.63	40.79	.....	.....
Varicocele.....	3.15	13.39	23.52	.....	.....

Headquarters Depot for Prisoners of War, Elmira, N. Y., July 10, 1865.

DIAGNOSIS.

BY JAMES M'MANUS, D.D.S., HARTFORD, CONN.

Read before the Connecticut Valley Dental Association.

It is not uncommon for dentists occasionally to see the work of other, and often celebrated operators, and, while admiring the artistic excellence of the operations, to hear remarks of a flattering character in many

instances of the manner in which they were performed. It is also true that at times we hear much of a disparaging nature, and while we would willingly admire, and be not a little envious of the ability to perform just such operations, we are somewhat compensated in knowing that we may have some other talent that will equalize the matter and set us just a little higher than at first we were inclined to put ourselves when judging the class of operations to which I have referred. We are often surprised that patients leave those who have performed such operations for them, until a chance word is dropped or an open avowal of dissatisfaction expressed, which gives the key-note to the change made, as they hope, for the better. "He may be, and no doubt is, able to operate well and thoroughly; but—he knows no more. He is a mechanic at the business, and nothing more. He does his work without regard to the condition of his patient or the state of the teeth he operates upon. He was rough. He tore my mouth badly, and I was sick for a week with a swollen face, and if he knew his business he never would have operated on my teeth until by treatment he had so prepared them as to insure a successful result." These, and complaints of a stronger type, I have often heard, as many of you, no doubt, also have, of those whom we look upon as successful and skillful practitioners. While desiring to have all believe that I am in favor of the most thorough kind of operations, I deem it also of the first importance that we should know *when* as well as *how* to operate for our patients' and our own best interests.

It may be said by many, "that will do very well to talk about. We must do the work when it comes and as best we can. Subsistence as well as reputation we must gain." I know the bread and butter side of the question myself somewhat, and have found, from the experience of others as well as my own, that it paid to refuse to operate at certain times, and to treat teeth rather than pursue the heroic style of operating, and subject my patient to intense agony while undergoing the operations, and often days of suffering afterward. The reputation of being one whose aim is to relieve suffering and prevent pain, as far as possible by a judicious exercise of every means that can be made use of to attain that end, is what every dentist should strive after. Those of long experience have observed frequently the ability of many patients to bear trying operations at times with comparative ease, and again the same patient to be quite uncontrollable while undergoing slight operations, and, upon reflection, have formed good reasons to warrant the change in their susceptibilities. Again, as operators, we often find ourselves, from some slight derangement, utterly unable to do as well and retain that command over our patients which is demanded to insure pleasant and successful operations. These few remarks lead me to the presentation of the subject on which I intend to say a few words, and I present them with the hope that they may produce discussion, and call forth the opinions of those of mature experience who are associated with us to-day.

DIAGNOSIS.—*I know.* The art of discriminating a disease by its symptoms, and one disease from another.—*Harris.*

In no specialty is there greater need of being an adept in the art of diagnosis than in the practice of dentistry.

To determine with certainty upon examination the condition of the teeth and parts we are called upon to treat, renders it necessary that both the eye and touch should be educated. The eye, with the color and general appearance of tooth structure in its normal condition, and the changes it undergoes from the first evidence of caries until its final termination in necrosis, and with the soft tissues likewise, in the changes evinced from simple irritation and inflammation to the more dangerous and malignant conditions which are often brought to the notice of the medical and dental practitioner. Dr. J. M. Riggs, of Hartford, an eminent dentist, related a case that came to him for treatment some time since, which will bear describing here. A lady called to have his opinion regarding a morbid growth in the inferior maxilla. He made a careful examination, and without making any inquiries gave as his opinion that the difficulty was due to an exostosed root or roots, or a necrosed portion of bone. The lady asked, are you sure that is all the trouble? He said he was. She then stated that she had suffered from it for one year; had consulted several physicians with regard to it at her home in the West, and they had pronounced it a cancerous growth. She had also consulted several dentists who were loath to touch it, believing with the doctors that it was of a malignant character. Dr. Riggs then explained to the lady his reason for believing his opinion to be correct. In the first place, the appearance of the enlarged growth did not indicate cancer, and the fullness of the maxilla gave evidence that there was a root or portion of dead bone imbedded there, and when using a probe he felt more confident that he was right. The lady, being assured by his evident ability and confident manner, made an appointment, was placed under the influence of chloroform, and had a badly *exostosed root* removed, which I had an opportunity to examine. The result of the operation was eminently satisfactory to the lady and to Dr. Riggs. I relate this case, which occurred recently, as illustrative of what many poor mortals have suffered from the ignorance of persons professing to be surgeons and dentists. One year of intense agony of body and mind dissipated in a half hour by the clear vision and dextrous hand of a surgeon dentist! Had he not been acquainted with the anatomy, physiology, and pathology of the mouth, he never would have dared to operate against the opinions of others. But having gained a perfect knowledge of the parts by study and experience, he was enabled to perform a successful operation, relieving his patient of a weight of mental and physical suffering. Such operations do more to elevate dentistry as a profession than hours of writing and talk on questions of a mere mechanical or manipulative character.

Many valuable hints have been presented in years past by the editors and writers in the dental journals relative to the mode of diagnosing toothache, and yet there is no doubt that many valuable teeth are now extracted which never have offended, but suffered from being found in the circle with others that have in a hidden manner provoked a general disturbance. Under such circumstances, when requested to extract teeth, we should not take the opinion of patients and be satisfied to act as they direct. To do so, in very many cases, would be to sacrifice perfectly sound teeth. We should carefully examine the tooth pointed out, and if the decay has reached the pulp, or so near that slight pressure with a probe causes pain, we may feel sure the tooth must either undergo a course of treatment or be extracted. Here let me remark, that the manner in which the examinations are made will, to an experienced patient, be the test of ability and carefulness. Some operators are by nature skillful and dextrous in their manipulations, and practice will, in time, give even a clumsy operator, if he has tact, some knowledge in guarding against wounding an exposed pulp, and the intense pain evoked by a careless touch. Frequently we are desired to extract teeth with but slight decay, and often teeth that are perfectly sound. In such cases it is advisable to examine carefully the adjoining teeth, and particularly to ascertain the condition of the wisdom teeth. Many times the irritation caused by the slow advance of the latter and the already crowded state of the arch is the secret of all the trouble and pain. If already erupted and affected by decay, in a vast majority of cases their removal will be all that is required to render the patient comfortable. Teeth that have been plugged for years, with the plugs in perfect condition, are frequent sources of trouble owing to the pulps having died from exposure to the influence of thermal changes. In such cases the removal of the plug, *if in position to warrant it*, or drilling into the pulp chamber, evacuating the *pus* and accumulations pent up there, will suffice to relieve the pain. This condition of things is sometimes difficult to diagnose with certainty, but when done at the moment, and the proper treatment followed up, the tooth may be preserved for years of service.

A frequent cause of toothache is the deposition of salivary calculus low down on the fangs of the teeth, and unless great care is exercised in the examinations to look for its presence, a faulty diagnosis may be the result. Often the amount is very slight, still it is from just such apparently slight causes that much suffering ensues. We cannot be too careful in the examinations, as it is only in this way that we can avoid doing an irreparable injury to a trusting patient. Patients often come to us who suppose that they are suffering from that terrible complaint called Facial Neuralgia. While then it is undeniable that there are many true cases of facial neuralgia, experience proves that very few of the cases which come to us for treatment are of that class. There might be found in every

village and town in this country patients who have been under the care of the general practitioner, and dosed for weeks, and even months, for what they termed neuralgia, and after exhausting the list of remedies, the aid of the dentist has been called, and a complete cure effected by simply paying a little attention to the condition of the teeth. Among the common causes of the so-called neuralgic troubles, which may be detected upon examination, are: 1st. Sensitive dentine. The treatment for this you have had more or less experience with. 2d. Irritated or exposed pulps. The application of the arsenical paste will quickly put that at rest. 3d. Alveolar abscess is a more difficult matter to overcome, and unless the tooth affected in this way is of great importance, the best plan is to extract it rather than attempt a cure. 4th. Necrosed teeth or roots. Necrosed bone and exostosed teeth or roots are also causes that require the educated eye to detect. Lastly. The malpresentation of the wisdom teeth is a frequent and often unsuspected cause of severe neuralgic trouble. A case in illustration of this occurred in my practice about two years ago. I was called to see a lady who was over forty years old; she had been suffering with severe pains, and finally thought her teeth might in some way be the cause of it. I examined them carefully, and found in the under jaw a posterior molar with an amalgam plug, but there was no sensitiveness on applying the usual tests. I asked if she ever had the wisdom tooth on that side. She said she thought she had, and that it had been extracted years before. I could discover no cause for her trouble and left her, and she continued to suffer for several months, all the while being under the care of a physician. At the expiration of about six months I was again sent for, as she had discovered a white substance emerging through the gum. I made an examination with a probe and found the wisdom tooth lying horizontally in the jaw, and very much decayed. I made a deep incision with a lancet, and advised her to come to my office the next day. She came, and after some considerable effort on my part, I succeeded in removing the tooth, and since that time her neuralgic troubles have disappeared, and the lady has much improved in health.

The systemic causes of disease I do not propose to direct attention to, but have merely touched upon those which may be detected in the mouth, desiring that as dentists we should endeavor to thoroughly understand what is accorded by all to be our field of operations; and it is our own faults if we remain in ignorance with the many advantages offered at the present day to improve ourselves in knowledge. In support of this it is only necessary to refer to the dental periodicals, filled with valuable articles on every conceivable subject appertaining to our specialty; the excellent colleges, with their energetic and talented corps of professors, devoting themselves untiringly to research and experiments, and freely giving the results of their labors to all who will take the trouble to become

students; and the numerous associations springing up over the entire country, inviting practitioners to come and impart that which they may have of knowledge and experience, and in turn to learn from others equally zealous with themselves, who attend with the same desire, to contribute their share to the common fund,—are each and all so many avenues established for the good of the profession and the amelioration of the suffering mortals who need our ministrations.

IMPORTANCE OF THE PRESERVATION OF THE TEMPORARY TEETH AND SIX-YEAR MOLARS.

BY WM. A. BREEN, D.D.S.

Read before the Odontographic Society of Pennsylvania.

As dentists, if there be any one branch of our specialty of more importance than another, it certainly is in the attention given to the deciduous or temporary teeth. Many suppose that, inasmuch as the temporary teeth are intended to subserve the wants of the body only for a short time, and are then to be succeeded by a stronger and better set, it is of little consequence whether they remain until they are removed by the operation of the economy to give place to others, or are lost a year or two earlier; but this is a great mistake, and it is one that has been productive of much mischief. If the morbid state of the gums and teeth of the little sufferer arise from some constitutional derangement, let it be pointed out to the parent or guardian of the patient, the necessity of administering the proper remedial agents, for the purpose of restoring these parts to their normal condition; if it be from local derangement, the attention of the parent or guardian of the patient should be called to the necessity of having the child's teeth kept free from the particles of food and other extraneous matter that lodge between the teeth and along the gums, and which, if permitted to remain, soon undergoes chemical decomposition and becomes a source of irritation to the latter, vitiating the secretions of the mouth, and rendering them prejudicial to the health of the former.

The temporary teeth, from these causes, are often soon involved in extensive caries, subjecting the little sufferer to the most torturing pain, and depriving it of the first set, long before the time of the appearance of the second has arrived.

Some teeth are more susceptible to the action of chemical agents than others, and, consequently, more liable to disease.

Teeth of a hard and firm texture are not easily affected, but those that are soft and chalky are readily acted upon by the fluids of the mouth, when in an impure and vitiated condition, and the greatest care and attention are necessary to preserve them, even for the short period their presence is required.

If, then, the parent desires to see his child possessed of a good set of permanent teeth, he will observe the instructions of his dentist, which should be, that the child, from the time it is old enough to use a tooth-brush, should use a soft brush at least once a day, for the purpose of freeing the approximal surfaces and their surroundings of all accumulations of impure or vitiated matter, which is so often the cause of caries in these parts; besides this, the parent can be instructed to send his child to the dentist at least once in three months, for the purpose of having the teeth examined, and counteracting by timely removal such causes as may produce disease. If these precautions are not taken advantage of, the disease becomes general, and when the patient can no longer withstand the excruciating pain, night or day, the parent brings the child to the dentist.

He diagnoses the case; he finds caries has been reigning supreme; it has become deep seated; decomposition has been suffered to go on uncontrolled; inflammation of the lining membrane has set in; it has conveyed its ravages to the periosteum, to the alveolar dental membrane; suppuration has set in, and, finally, exfoliation of the alveolar process.

A case of this class came under my notice for treatment some time ago, the patient being a little girl. I removed the sequestrum with the tooth remaining attached, and, after washing the parts out with a syringe, using dilute tincture of myrrh, in two sittings healthy granulations formed, and the child had no more trouble. I asked why this child had not been brought sooner; the mother said she had a physician to the child; finally, at the eleventh hour, he concluded it was a case for the dentist. The disease was located in the left superior molar; the age of the child was between five and six years.

Caries of the temporary teeth may be arrested, if the patient is sent to the dentist in time, by proper treatment, which consists in removing the disease and filling the cavities with gold; if they are subsequently kept clean, this treatment will often preserve them until the economy throws them off. If the case comes too late, and the time for the eruption of the permanent near, even then, unless the patient is suffering unbearable pain, the tooth should not be removed.

If the lining membrane becomes involved, treat the same as in a permanent tooth, and fill with Hill's stopping, that is, the bulbous cavity; the roots of the deciduous teeth should not be filled, as the foramen is constantly enlarging from absorption; if trouble should ensue from the filling, it is easy to remove it, and by cleansing and syringing it out, and the use of soothing palliatives, it may still be borne with, and the patient in after-years will not regret the protracted stay of his temporary teeth.

About the age of five or six years the first molar makes its appearance

above the gum, a sign that the shedding of the temporary teeth is about to commence; indeed, under favorable conditions, they will then begin to drop out at various times as their roots become absorbed.

As it would occupy too much of your valuable time at present to narrate the different periods of eruption, I will confine my subject to the six-year molars.

The first molars are so frequently mistaken for a portion of the temporary set, and such unhappy consequences result from this error, that those having the care of children should be particularly directed to this point.

These teeth are sometimes permitted to decay from want of care, and under the impression that they are the temporary teeth, and only following their proper course; sometimes they are extracted for some slight cause, when the whole arch becomes imperfectly developed, and the most painful and tedious cases of irregularity are often the result.

A case of this kind was presented to me only a few days ago by a parent, requesting me to remove the left inferior six-year molar; it was a case of simple caries. I told the father the tooth should not be removed, but if thoroughly prepared and filled, it would, perhaps, last for many years. The patient was a boy eight years old. I spoke to the father of the injurious effects it would have upon the arch to remove the tooth before the other teeth had made their appearance; the tooth was filled, and by that means saved.

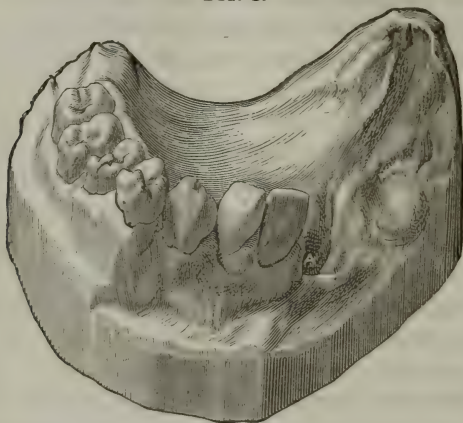
A CASE IN PRACTICE.

BY J. A. WOODWARD, D.D.S., PHILADELPHIA.

THE following case was constructed for a young gentleman who received a severe gunshot wound during one of the battles in Virginia. Fig. 1 represents the condition of the upper jaw. The alveolar and palatine processes are entirely removed on the right side. The left central, lateral, and cuspidatus, with the process and maxillary bone immediately beneath, being broken away from the main part of the bone, fell inside the lower teeth three-eighths of an inch and were allowed to become fixed in that position. An opening A extends from the mouth to the nose. The molars only retain the original articulation, the bicuspidals having been drawn by the contraction of the parts inside the outer cusps of the inferior bicuspidals. The right cheek, deprived of its support, falls in considerably, and requires some force to press it to its proper position. An impression cup was made to suit the case with which a sufficiently accurate impression in white wax was obtained. The gold plate was continued back to the last molar and over and in front of the

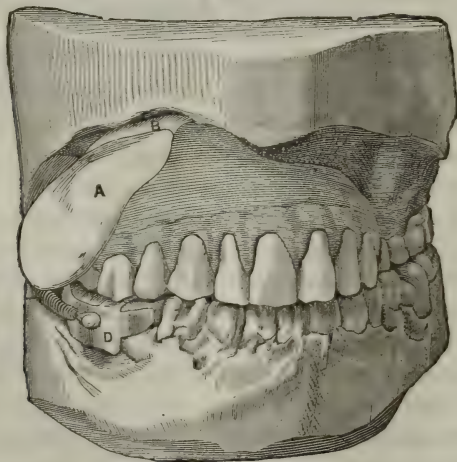
remaining three front teeth. On the right side it encroached upon the muscles of the cheek, consequently the cast was built up here that the edge might be raised and well rounded. As the opening A is still contracting, the plate was run across instead of down into it. Around the second molar was placed a stout clasp. This was slightly soldered to

FIG. 1.



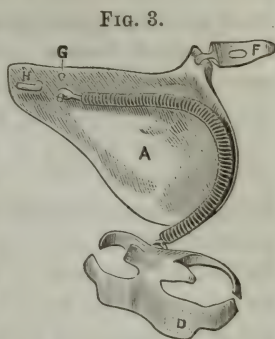
the plate and the whole then thoroughly fitted to the mouth. The articulation was next taken in the usual manner. The teeth were set as shown in Fig. 2, being attached by vulcanite. To have depended entirely upon clasps to support the case would have brought too great

FIG. 2.



pressure on the teeth clasped, as the cheek is continually pushing the set downward, especially when the mouth is open. A spiral spring was

therefore used on the right side. This was fastened below to a small plate D, fitting between the second molar and second bicuspid. Above the attachment was not so readily accomplished. The gums of the artificial molars were ground off nearly to the teeth and the vulcanite over them well cut away to let the spring set in. Over this was stamped a piece of gold plate, the anterior and superior edges of which were nicely adjusted so as to present a smooth surface with the vulcanite and the plate B. This sort of shield was extended back to lift the cheek free of the spring, the posterior margin being smooth and round. Behind it the food would necessarily accumulate and be difficult of removal. Therefore it was contrived to be taken off and replaced at the pleasure of the wearer. Fig. 3 shows the shield with spring and plate for lower jaw. H is a heavy wire bent at a right angle to hold the front end securely in its place; G is a small pin to give additional firmness when the plate is in its position; F is a hasp which passes around the posterior part of the vulcanite and over a catch on the lingual surface of the set. This catch was driven in the vulcanite well up to the plate, out of the way of the tongue. The set has been in use for nearly five months, and seems to fully meet all requirements.



TARTAR—ITS CONSERVATIVE EFFECTS.

BY HENRY S. CHASE, M.D., D.D.S., IOWA CITY, IA.

Tartar, or the earthy salts deposited from the saliva upon the teeth, is usually deemed injurious. But I do not so consider it. It is only hurtful when allowed to *accumulate* upon healthy and sound teeth. It is not injurious in the least to enamel or dentine. The only harm it does is to create an irritation of the gums and periosteum, thereby causing a recession of the former, and an absorption of the alveoli, and a consequent loosening of the teeth.

Now, these evil effects rarely or never happen in the mouths of those who pay proper attention to the teeth.

The salts of the saliva are intended to be beneficial to the dental organs.

There are various kinds of *tartar*, differing in their physical characters according to the temperaments of the individuals in whom it is produced; but they are all composed *principally* of phosphate and carbonate of lime, being held in compact mass by fibrine and mucus. The evident

intention of these lime salts is to neutralize any acids that may be present in the mouth, from food, drink, or eructations from the stomach. That they do so, no intelligent observer can doubt.

How nicely Nature sometimes plugs decayed teeth with this material! and the tooth is preserved more perfectly than gold could do it under the same circumstances, for SHE does not even take the trouble to remove the *decayed* portion of the tooth. A *dental cavity of decay* will not progress in the least after this process has commenced. We have all frequently seen bicuspid and molars plugged with this *tartar* which was preserving them *perfectly* from further decay. Nature was kindly doing its best for the tardy patient, who ought to have come into our hands long before. An *aching* tooth was a proper warning to visit a dentist, but as the voice was unheeded, Nature plugged the cavity with the best material she had.

A soldier called, recently, to have his teeth "looked after." He had been in "service" four years. His teeth had decayed and ached on the right side of the mouth. He was unable to obtain dental service. He was forced to quit masticating his food on that side. *Tartar* accumulated to considerable extent. I plugged the aching tooth, and several other decayed ones, on that side of the face. I removed these temporary plugs, and found the decayed portions of these cavities fossilized. I plugged them with gold, and *hope*, notwithstanding the additional work they will have to perform, that *my* operations will prove as conservative as those of *Nature*.

REPORT OF TREATMENT OF EXPOSED PULPS AND ALVEOLAR ABSCESS.

BY J. S. LATIMER, D.D.S.

SOME two years ago, I drew up a tabular sheet for the better recording of all cases of exposed dental pulps and inflamed peridental membranes coming to me for treatment.

Believing, as I do, that increasing the number of intelligent observers and the preservation of their observations with a view to their collation and comparison, would greatly conduce to the fund of knowledge in this direction and that much good would come of it, I presented my plan to the Dental Associations of New York and Brooklyn.

They appointed a joint committee, who slightly revised it, and caused one or two thousand copies to be printed and distributed. In the margin of the table was a note requesting observers to send in their reports at the close of each year to Dr. Wm. H. Allen, chairman of the committee.

At the close of last year, one report had been received by the chair-

man, and only one! Regretting the negligence and want of interest manifested by the profession, I do not despair of their ultimate assistance, and in the mean time shall report, periodically, through the DENTAL COSMOS.

The following is the heading of the tabular sheet referred to.

NUMBER OF CASE.

1. Page of Journal.	24. Pulp devitalized with arsenic.
2. Date.	25. " " " instrument.
3. Name.	26. Arsenic caused pain, hours.
4. Sex.	27. " " no pain.
5. Age.	28. " remained in tooth, days.
6. Nativity.	29. Pulp removed, days after.
7. State of Health.	30. " " perfectly.
8. Temperament.	31. " " imperfectly.
9. Tooth, number of.	32. Treated for abscess through fang.
10. " is strong.	33. " " " " ext. alv. proc.
11. " " frail.	34. " with how many dressings.
12. " occludes.	35. " how long, in days.
13. Pulp, healthy.	36. Medicated filling in fang, with what.
14. " bled.	37. Filled " "
15. " inflamed.	38. " crown " "
16. " suppurated.	39. Degree of confidence in success.
17. Peridental Membrane, healthy.	40. Followed by transient inflammation.
18. " " inflamed.	41. " " chronic "
19. " " suppurated.	42. " " abscess.
20. Dressed pulp with.	43. Hopeless, and removed.
21. Capped " "	44. Unnecessarily "
22. Filled temporarily, when.	45. Healthy months, after filling.
23. " permanently, "	46. Case went by default.

EXPLANATIONS.—The temperaments (8) may be designated by the initial letters N, B, L, S, for nervous, bilious, lymphatic, and sanguine.

In reporting, the formula of the pulp-devitalizing preparation and such others as may be deemed essential, should be given. The degree of confidence (39) may be designated by the employment of figures on a scale of 0 to 7, perfect confidence being indicated by 7. Commence to number (9) at the median line. Thus, S R 3 is the superior right cuspid, while I L 6 is the inferior left first molar. Removed the pulp how many days after the arsenic was applied (29). (34) Has reference not to the *kinds* of medicines, but to number of times they are applied. 19 Refers to cases with fistulous discharge.

A good plan is to have the heading printed or written on a long strip of stiff paper, and keep it in a long blank book, ruled to agree with the heading, which, from its being movable, is much more convenient than it would otherwise be.

The following summary was taken from my case-book, June 8th, 1865:

Whole number of cases recorded.....	116
For Males.....	34
“ Females.....	82
Treatment of Incisors and Cuspids.....	29
“ of Bicuspids.....	48
“ of First Molars.....	22
“ of Second “.....	9
“ of Third “.....	8
With Living Pulp.....	79
Devitalizes “ with Arsenic.....	72
Arsenic failed and I extirpated (patient anæsthetized).....	7
“ gave pain in.....	27
“ gave no pain in.....	52
Pulp removed perfectly.....	35
“ “ imperfectly.....	44
Required treatment after supposed cure.....	7
Cases went by default, patients not attending.....	21
With peridental membrane inflamed.....	37
Minimum number of dressings.....	1
Maximum “ “ “.....	30
Average “ “ “.....	8
“ “ “ days.....	29
Required treatment afterward.....	0
Cases went by default of patient.....	11
Had fair opportunity and failed.....	1

I may say that the paste used in devitalizing pulps is after J. D. White's formula, and that the principal dressing relied upon in the treatment of abscess is Atkinson's favorite, the solution of iodine in creosote.

All who treat abscess to any considerable extent will recall that very many cases in which the pulp has been dead and the peridental membrane quiet for months, or even for years, will become troublesome immediately after the commencement of treatment.

This table makes no account of this fact, and, in that particular, is imperfect. A slight modification will correct this. It will be noticed that I have made provision for the treatment of exposed pulps with a view to their preservation, and that I have no such cases recorded in my summary.

This comes from want of faith, as far as my own record is concerned, but I desire that those who do have better success in the salvation of such pulps shall have the opportunity of recording their cases.

There is little doubt in my mind that we would be less conceited in the notion of our own practices, if we could, every one, keep such a record.

I frequently hear my brethren of the profession say, "I do not find that pain is caused by the preparation of arsenic used by me." It is more than probable that a question propounded to the patient and the reply

recorded so that it could not be forgotten, would tend to diminish the too exalted notions of the amiability of arsenious acid.

With regard to the time employed in the treatment of cases of alveolar abscess, I will say that the average is very much higher than necessary, from the fact that many patients are unable to attend to it continuously or they are deficient in punctuality, so that a case which might be cured in a few days, drags along as many months.

If I shall succeed in getting even one other individual interested in this matter, the object of this paper will be attained.

45 East 13th St., New York.

A DENTAL SOCIETY IN MARYLAND.

BY GEO. S. FOUKE.

It is passing strange that Maryland has not yet formed one or more dental societies. This State is intimately and honorably connected with dental progress by means of organized effort and association. The names of Hayden and Harris are first on the list of those worthy "*pioneers*" who lived and labored for the welfare and dignity of the profession. They were both ardent advocates of dental societies, and aided in their organization on all proper occasions.

It was certainly a source of regret to every liberal-minded practitioner of our art, that, in consequence of having no State or local society, the State of Maryland had no representation in the Hall of the Smithsonian Institute on the 31st of July, 1860. For on that day was duly formed the AMERICAN DENTAL ASSOCIATION. The organization of this elevated phase of dental association was another triumph added to the great achievements of American dentistry.

This last and best form of dental association has succeeded beyond what could have been anticipated by its most sanguine originator and friends. The meeting held at Chicago this year was represented by one hundred and forty dental practitioners from thirty-three different societies and colleges. Its proceedings have been of an elevated and useful character, and the profession have just reason to expect great things in the future from this National Association of dentists.

In view of this prospective result, where is the dental practitioner who does not feel his bosom swell with a desire that his State should be an active participant in the noble work in which the Association is engaged?

Maryland! my Maryland! Why hast thou no dental society? An enlightened lady, who takes a lively interest in everything connected with the honor of the State, remarked to me, in a late conversation upon matters affecting the character of the dental profession in Maryland, that it was

"a great shame that Maryland has no *Dental Society*!" We, indeed, felt that her criticism was just, and we at once determined to raise an appealing voice to the profession in the hope that its worthy members would rouse from their slumbers and organize the talent of the State, and thus wipe out this stigma upon our reputation.

Who shall have the honor of the initiative in the movement of organization? Our lady friend thought the "Gentlemen of Baltimore ought surely to make a move in this direction." What say you, gentlemen? Shall we wipe out this burning shame? Will you make the move? If our *city dentists* will only make the effort, we feel satisfied that a handsome success will crown their action, and reap a rich harvest of reward for having done our duty to ourselves and to our dear old State! Gentlemen of Baltimore, we wait upon your action.

WESTMINSTER, Md.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK STATE DENTAL DELEGATION.

REPORTED BY JOHN M. CROWELL, OF NEW YORK.

ON motion, the delegates were called on to participate in the discussion alphabetically.

CLASPS, BEST METHOD OF MAKING AND ADJUSTING.

Dr. J. C. Austen, of Albany, fits all his clasps by swaging them on the metal die; adjusts plate and clasps in the mouth with hard wax in the usual way, and solders; experiences no difficulty or injurious effects when the piece is properly adjusted.

Dr. D. F. Benne, Albany, avoids the use of clasps as much as possible; prefers atmospheric pressure. Instructs his patients to observe strict cleanliness under and around the clasps.

Dr. John M. Crowell, of New York. The object to be attained by clasping to the natural teeth is stability to the artificial denture. This is secured in a greater or less degree, corresponding to the adaptation and adjustment of the plate and clasps. Close adaptation of clasps cannot be obtained by bending with pliers. To test this, attempt to fit a metal collar to a round bar by bending. A good method is to take an impression of the tooth designed to be clasped; make a model of plaster and asbestos; wind that portion of the tooth designed to be occupied by the clasp with hair platina wire, coiling it evenly around the tooth a little wider than the clasp is desired; borax it well; flow scraps of plate or clasp material over it to the desired thickness; pickle the ring; file out the opening, and dress into shape. At points where the platina wire has

bridged over either fissures or indentations in the tooth, the gold will flow through the coil and form a perfect adaptation to all parts of the tooth covered by the platina wire. (In answer to a question, the fine platina wire is obtained at S. S. WHITE's Depot, New York.) Adjusting clasps should always be done in the mouth. A good plan is to place the plate and clasps in place in the mouth; take an impression in plaster of a sufficient portion of each to hold them in their relative positions while running the soldering investment. Another method is to place plate and clasps on the model, bend a piece of wire or strip of plate in the form of a bow, solder one end to the plate and the other end to the clasp; when thus temporarily united, any alteration of the relative position of clasp and plate can be made in the mouth by bending the connecting bow.

The plaster impression will be found to meet the requirements of every case, with less consumption of time and material, than the method by wire or strip of plate. It is preferable in all cases, where practical, to clasp the largest or bulb portion of the tooth. The clasps can be retained at the point desired by arms or standards connecting them to the plate, leaving as much of the tooth exposed between the clasps and plate as is consistent with strength; to be kept clean by the passage of fluids, and friction of food and the tongue.

These standards are readily made by laying pieces of thin platinum, of the sizes desired, on the model tooth, and binding them to their places when coiling the wire around the tooth; flowing the gold over them at the same time with the clasps.

Dr. French, of Troy, fits clasps to the teeth in the mouth by bending them as accurate as possible; adjusts them to the plate in the mouth with a mixture of rosin and beeswax, sufficiently hard to keep them in position when removing them from the mouth.

Dr. Mills, of Brooklyn, had a tooth in his own mouth, applied by clasps, which first called his attention to dentistry. Was unfortunate in falling into rough hands; his teeth were separated with a coarse file. Formerly was opposed to clasps in any form; must differ with the president; has seen clasps adjusted to the thickest portion of the tooth worn with great satisfaction. Objects to atmospheric plates; they obstruct the speech; prefers plates as small as possible; prefers to replace bicuspid with two pieces; as in all cases where the plate covers the arch, the speech is injured.

Dr. J. A. Perkins, of Albany, has had his attention frequently directed to the injury done to teeth by clasps; thanks Dr. Crowell for his remarks, and will adopt his method; clasps are injurious from forming a lodgment for foreign substances; the acid evolved disintegrates the tooth not only under but also around the clasp; has never seen clasps used that were not injurious to the teeth; prefers atmospheric pressure; prepares his chamber by tamping the plate well around the edge of the chamber, and

solders a half-round wire in the groove thus formed, and trims the chamber to a sharp edge; is opposed to clasps; they have been the cause of the loss of thousands of teeth; when compelled to use them, makes them by cutting and shaping a lead pattern to the tooth; cuts the clasp by this pattern, and bends into form as accurate as possible with blunt-nosed pliers; clasps also induce disease of the periosteum; has yet to see the first case where from clasps the teeth have not sustained more or less injury.

Dr. Scranton, of Bennington, Vt., abandoned the use of clasps some years since, from the cause stated by the president; in making clasps, thinks there can be no improvement on Dr. Crowell's plan.

Dr. Strong, of New Haven, Conn., always uses atmospheric plates; does not use clasps.

Dr. P. Sloan, Cananoharie, N. Y., never uses clasps unless compelled.

Dr. A. J. Waid makes his clasps as described by Dr. Perkins.

Dr. B. Wood, Albany, N. Y., agrees with the remarks of Dr. Mills. If the clasps are adjusted improperly, they will wear the teeth.

The President remarked, the injury was not so much from wearing away the teeth as disintegration.

Dr. W. It is easy to discriminate between wearing away and disease. One frequent cause of disease is setting clasps below the gum; when properly arranged, and cleanliness is observed, there is not much injury to be apprehended from clasps.

Dr. H. H. Young, Troy, N. Y., was not much in favor of plates; prefers narrow plates, and is opposed to thin plates covering the whole mouth.

ABSORPTION OF THE ALVEOLAR PROCESS, AND ITS TREATMENT.

Dr. W. H. Atkinson, of N. Y. When we are asked the cause of disease, we know nothing absolute. No primate or ultimate body has been, as yet, demonstrated. We are but playing with a few of the links in the chain of causation. Our most complete demonstrations are but in part, outside of the mutation of numbers or the science of mathematics. When we investigate the causes of disease, it becomes necessary to divide them into two grand classes, which may be called constitutional and local. No constitutional disease can exist without lessening local power; no local disease can exist without constitutional deterioration. Conditions are concomitant and causal: when causal, they are traceable to constitutional or local origin; when concomitant, they are merely coexistent with the deterioration that may be present, dependent upon whatever cause; thus, loss of the free borders of the alveolar process and gums is sometimes merely the local expression of constitutional derangement, such as mercurialization, syphilization, etc., while local loss, without the intervention of the inflammatory process, is always the result of mechanical force locally applied, such as too freely brushing, depriving the peripheral cells of freedom of nourishment.

Health and disease are but our methods of expressing greater and less degrees of vital presence. This is the mysterious agent that presides over the nutrition, no less than the coherence of all bodies; coherence itself dependent upon the currental lines of magnetism, health, etc., which sets up affinities and repulsions between the parts of bodies, as well as distinct individuals.

The example of loss of substance from too vigorous brushing is but an instance of this force displayed in what we denominate friction. Bodies in which diverse degrees of life-presence move upon each other with less of friction than those of similar degrees, as exemplified in two pieces of soft iron creating so much friction when moved against each other, are made to glide so readily when one of them is carbonized and chilled. This law has been taken advantage of in composition metal used as boxes upon which axles are required to play. These currental lines take their origin from debris deposited upon the necks of the teeth, in consequence of want of cleanliness as well as the specific softening action of certain foods and medicines, thus affording nuclei for the deposit of tartar. The treatment necessary is to remove all foreign substances where deposited by polishing with an Arkansas stone, and dressing with tannin and glycerin or creosote and iodine, as the case may require. In weak constitutions, support by tonic treatment; also antidoting any cachexia that may be present by the means suggested.

Dr. J. C. Austen, of Albany, could add but little information; excoriates and cuts away the gum when denuded; uses principally creosote; sometimes iodine; when iodine is used too soon, it is liable to slough away the parts, and the disease returns.

Dr. W. H. Atkinson was requested to explain his treatment. For a local remedy, the resublimed saturated solution of iodine and creosote is exactly adapted to arrest the secretion of pus; iodine, when in full strength, kills the unhealthy parts; when the exudate assumes the appearance of white of egg, dress with glycerin one part, tannin two parts; and when it assumes a creamy state, dress with wine of opium, retained by a pledget of cotton saturated with the glycerin and tannin.

Dr. B. Wood. When the alveolar border is absorbed, can it be reproduced?

Dr. Atkinson has answered this question so often, supposed it a settled point; whenever you can get a pocket to hold the plasm, reproduction is certain, with proper treatment; he had never promised that the free border could be reproduced in its attenuation; doubted it himself; but spoke and doubted too soon; spoke before nature had completed her work; has not, as yet, had an opportunity of examining any cases by dissection; but as far as could be observed by diagnosing through the gum, he unhesitatingly answered yes, the alveolar border is so produced in its attenuated form.

ORGANIZATION OF THE MISSOURI DENTAL ASSOCIATION.

IN accordance with an invitation recently issued by the "St. Louis Dental Society," there assembled on Tuesday, October 31st, some fifty gentlemen engaged in the practice of dentistry in this State, for the purpose of considering the propriety of organizing a State Association.

On motion of Dr. Peebles, Dr. John S. Clark was called to the chair and Dr. Morse appointed Secretary.

Drs. Forbes, Sloan, Comstock, Eames, and Depp, were appointed a committee to prepare a constitution, which was adopted as a whole, without one dissenting vote.

The following gentlemen were, on ballot, declared duly elected officers of the society: President, H. B. McKellops, St. Louis; 1st Vice-President, G. S. Morse, Columbia, Missouri; 2d Vice-President, M. McCoy, Boonville, Missouri; Recording Secretary, H. Judd, St. Louis; Corresponding Secretary, J. Payne, St. Louis; Treasurer, A. M. Leslie, St. Louis; Executive Committee, Drs. Blake, Sloan, and Samuel, of St. Louis.

A part of the morning session was spent in obtaining the experience of some of the members as to the cause of some practical difficulties in vulcanizing of dental rubber.

The afternoon session was taken up with an interesting interchange of views on the best method of destroying and removing exposed pulp.

Arsenious acid was the agent all relied on, combined by some with sulph. of morphine and creosote. The experience of all showed that a very small portion only of the first agent is necessary if placed in immediate contact with the pulp.

At the evening session a discussion on the treatment of perio-dental inflammation arising from the presence of tartar and other foreign substances at the margin of the gum, was entered upon.

The association resolved to spend Wednesday morning in clinics. Drs. Forbes, Peebles, Stark, Eames, McKellops, and Barron were appointed operators.

CORRESPONDENCE.

THE PROFESSION IN ENGLAND.

DR. J. H. MCQUILLEN.

DEAR SIR:—In complying with your request to give you an account of my visit to Europe, viewed from a professional stand-point, I am aware of the difficulty a foreigner experiences sojourning but a limited time in a strange country in forming a correct and unbiased judgment of men and things as they pass before him. We have ourselves just reason to complain

of the hasty criticisms which have too often been passed upon us, both as a nation and a profession. And the charity which we claim for ourselves, we are in duty bound to grant to others.

I can only give you, to a limited extent, some of the impressions made upon my mind which seem to be warranted by the facts. All matters of personal success would hardly be suitable to the present occasion. The following remarks, therefore, must be considered only as an individual American's opinions.

My acquaintance with the profession in England, and particularly in London, was most happy in many respects.

There was a cordiality shown in many instances to me, a comparative stranger, which no one receiving such kindnesses with a spark of gratitude in his heart, could fail to appreciate, and yet John Bull is rather chary in his friendships. He is not a flatterer, neither is he easily flattered. If he has confidence in you, he makes you his friend; if he has not, he does not disguise it. This applies equally to our profession as to all other callings. However so much we may, as Americans, claim superiority over all the world, he does not take our word for it, but only believes it upon proof. Neither is the acknowledgment on his part of our superiority in many branches of the profession any reason for his awarding to us excellence in other branches of which he has no proof. On the whole, he is suspicious of us. His primary impression of us is, that we talk a great deal, and that it ends in talk. He gives us the credit of talking sweetly and writing smoothly, but will hardly admit any superiority of works. It has been somewhat unfortunate for us that we have been often represented abroad only by those who had a poor axe to grind, who have made too many pretensions, and whose idea of making money out of the profession was too palpable. While an Englishman's regard for professional ethics is not too tender for himself when the opportunity occurs, he is much shocked in seeing it in a foreigner.

A sure way, however, of winning his respect is to present real merit in as modest and as unassuming a manner as possible, avoid treading upon his prejudices, and gracefully acknowledge what he has accomplished.

The social position of the Dentist in England is not unfavorable. He is regarded as a "professional" man, and takes higher rank than one engaged in commerce or the arts. Disguise it as he may, the professional man looks down upon the "mere tradespeople."

I cannot regard the profession, however, as giving promise of that progress and development which is shown in our own country. There is a liberty which we possess which they do not, and which too many of us fail to appreciate, which enables us, without fear or risk, to strike out boldly for ourselves any new line of conduct or practice. We have no entangling alliances with other professions which keep us ever in awe.

We are not continually waiting to be recognized. Dentistry in our country stands on its own bottom; in England it is the offshoot of surgery, which is also the offshoot of medicine. The Physician ranks the Surgeon, and the Surgeon the Dentist, and too often the Dentist allows himself to be dictated to by his superior. This influence is not always the most healthy.

Their present system of fees I cannot regard as having a tendency to develop the highest professional skill. With the better class of dentists, a guinea (\$5.25) is the universal fee for a service performed—it matters not whether it is extracting a tooth, cleaning, consultation, or filling, either large or small, gold or cement, a guinea is received. The idea does not seem to be conveyed at all of labor performed, and wages accordingly; but that idea, handed down from past ages (noble enough in itself, but not always practicable), of performing a humane act, and making no charge, but leaving it to the gratitude of the recipients to reward the doer, and by long custom that reward, gratuity, or fee, is universally recognized as a guinea. It will readily be seen that it takes a strong character, where there is a full practice, to resist the temptation to extract a tooth and get the guinea when no more would be received from putting in a gold filling that would require an expenditure of much time, money, and skill.

There is also a very numerous class of “dead heads”—physicians, surgeons, clergymen, the household servants of regular patrons, and others from whom no fees are received. All these have a tendency to discourage the performance of the noblest desires.

Neither have the people, to any extent, been educated in the simplest rudiments of the science of dentistry. The idea is somewhat prevalent that a troublesome tooth may be filled up with a little gold or cement, and that will relieve it. In my hearing a dentist of honorable standing and a most excellent man said to a patient who was complaining of pain in a tooth, “You had better let me put in a little gold, and that may ease you.” Neither are those operations which in this country are considered as among the most skillful performed, at all appreciated by the patient.

Our friend Atkinson would find his elongation of incisors with gold “no sale.” They are so opposed to the exposure of any foreign material which would indicate decay and repair, that they would not consent to make their mouths an exhibition room for any man’s operations, no matter how skillfully performed; neither will they give the time nor the money necessary to the introduction of such fillings, nor is the salvation of an important incisor a sufficient inducement to submit to the mortification of such an exposure.

The filling of ordinary cavities with gold, larger and more difficult ones with amalgam, and extracting the others, comprise the principal operations performed upon the teeth. From what I saw, I am inclined

to think that an improvement in instruments would produce a corresponding improvement in the character of the work. Delicate serrated points, adhesive gold—either foil or sponge—the mallet, etc., are institutions but little known in general practice.

In mechanical dentistry great changes have been made within a few years. Vulcanite has almost entirely supplanted the old carved ivory bases; and plain teeth, without porcelain gum, but with an artificial gum of pink vulcanite, are in very general use. In gold work, the accuracy of the adaptation of the teeth to the plate, as well as many other evidences of nice mechanical skill in very many cases, is all that could be desired, and should challenge our admiration. There are many other things also which we would do well to imitate.

There is not such a headlong rushing into the profession, and setting out for an independent practice before they are half qualified by education, as with us. Young men are more patient, better satisfied with waiting until wisdom and experience is gained from practice before expecting to compete with their peers. It is no easy matter to obtain a good practice in England unless by purchase.

The transferring of a practice is not an uncommon thing, and, strange as it may appear to some of us, the purchaser gets what he bargains for; that is, he can pretty surely depend on nearly every one of his predecessor's patrons coming to him. A successor there means more than with us. The consequence of such an unchangeableness is, that a good practice without purchase is a thing of very slow growth.

Your pages will hardly permit of anything in the way of personal reminiscences, and yet I cannot close without saying a few kind words of some of the most noble and most gentlemanly men of our profession in the world, and of whom I wish it could be the privilege of all who read these lines to know them as I have known them.

Separated as we are by three thousand miles of ocean, by a government and political institution entirely different with the tastes and manners of the people, in many respects at variance, but with a language and a profession in common, I feel it not only a pleasure but a duty to make them a little better known to us. Of the few who I mention, I intend no invidious distinction; they are but the representatives of many others who might be named. Some of the pleasantest remembrances of London are those of that Nestor of the profession, Mr. Arnold Rogers, who has already seen the allotted time of man, but who is still vigorous and hearty, and devotes a portion of his time to active practice. His kind and fatherly advice, on more than one occasion, endeared him very much to me. His three sons are his legitimate successors, and amply sustain his well-earned fame.

The elder, Mr. Thos. A. Rogers, a most genial and warm-hearted man, is the present President of the Odontological Society, which is sufficient

indorsement of the confidence of that body. Of Mr. Tomes, Fellow of the Royal Society, Mr. Saunders, Dentist to the Royal Family, and Mr. Charles Vasey, Dentist to St. George's Hospital, I can only speak in terms of unqualified admiration. Mr. Vasey, by his education, his investigations with the microscope, and his large collection of preparations, is eminently qualified for the position he holds as a Lecturer to the Students at St. George's Hospital.

It is almost worth a trip across the Atlantic to spend an hour with him or Mr. Tomes in conversation on scientific subjects. Nor can I ever forget the cordiality shown by that most eminent of naturalists, the distinguished Prof. Owen, whose connection with the British Museum gives him most rare opportunities for the explanation of his favorite theories.

In Mr. Charles James Fox, editor of the British Journal of Dental Science, the Odontographic Society will find a most valuable corresponding member, and it gives me pleasure to find his name among the recent elections. Any attempt to speak of all of whom there are pleasant remembrances would, in this place, be impossible. As a whole, I found them genial, courteous, and refined. In their public debates, orderly and respectful. In but one instance did I see anything to the contrary, and in that my country and my people were spoken of in terms anything but courteous and respectful; but justice to others requires that I should also state that he was ultimately rebuked.

Hoping that the time is not far distant when we may have the opportunity of welcoming them upon our shores,

I am truly yours,

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A CORRECTION.

IN the report of the late meeting of the AMERICAN DENTAL ASSOCIATION, at Chicago, there is a mistake in which I am interested. A committee of *five* was appointed to report a formula for a dentifrice, of which Dr. Jas. McManus is chairman. The report makes it a committee of *four*, with *myself* for chairman. It is important that this committee act up to its requirement; hence justice to the cause as well as to Dr. McManus renders this correction necessary. The official minutes are probably correct, but the report might mislead, and thus defeat the measure.

GEO. WATT.

OBITUARY NOTICE.

DIED, at his home near Phoenixville, Pa., on the twenty-ninth of April, from disease brought on by exposure and privations while a prisoner of war in Andersonville, Georgia, and Florence, South Carolina, DR. JAMES A. CORNETT, dentist, in the forty-sixth year of his age. He was a member of Co. F, 5th Penna. Cavalry.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"The Food and the Teeth (Concluded).—Observations on the Inorganic Constituents of the Food of Children, as connected with the Decay of the Teeth, and the Physical Constitution of Women in America.—By JAMES PAUL, M. D., of Trenton N. J.—We now advance from infancy to childhood—and this is a period when the greatest attention is required in supplying nutriment to aid nature in the great work of developing the body. The child is now deprived of the maternal secretion, and dependent on food prepared for its use by the hand of man—perhaps living in a city, and deprived of pure and wholesome milk from the cow. And we know there is a vast disproportion in the quality of milk when the cow is country fed on the natural productions of the farm, and when city fed on slops and grain, the refuse of the brewery.

"It is at this age that the great proportion of bony substance is deposited; those of the extremities are lengthened, become more compact and stronger, and the substance of the teeth is deposited in the cells of gelatinous tissue. How necessary is it, then, that this subject should receive the utmost attention of parents. It has hitherto been too much the custom to leave all this, as belonging entirely to nature—as a thing we had nothing to do with. We have been too much in the habit of considering that nature furnished her own materials, and man had nothing to do with her operation. The potter cannot fashion the bowl without the clay, neither can bone be formed without earth. No, my friends, nature must be supplied with the material, which, although offered in the most incongruous forms, she has the power of decomposing, selecting from, and supplying for the various purposes required; one portion, as we have already stated, to act as fuel in keeping up the temperature; another portion she selects to add to the flesh, the muscle, skin, and different tissues; and the earths which are held in solution, she carries away by vessels adapted for that purpose, and deposits them atom by atom, until they are so compressed, so strongly compacted together, as to become what we call *solid bone*; and all this so wonderfully wrought, that as we have seen, small tubes are left in the hard stony formation both of the bones and of the teeth, that nourishment may be supplied them, holding in solution the material of which they are composed, that the natural waste and decay may be replaced, and injuries repaired.

"It is to this nutrition, and of the earthy matter of which the bones and teeth are composed, a deficiency of which is attended with results so deplorable, that I particularly wish to call your attention.

"To what can we attribute the calamity which too often befalls the young? I allude to distorted spines, where the bones composing the spine, instead of forming a column, allowing the body to be erect and dignified, are zigzag in their course, causing one shoulder to bulge out, and the opposite side to bend or double upon itself. This deformity has been long understood to arise from a deficiency of *lime* in the composition of the bones of the vertebræ, allowing them to fall, press upon,

and injure each other, destroying the beauty of the fabric, and the health and comfort of the individual.

"Now let us take a glance at the inhabitants of two countries, natives of which are no strangers on this continent. I take them as examples, because the food of the *common people* of those countries is well known to be of the most common kind. I allude to the natives of Scotland and Ireland—the principal food of one being *oatmeal*, and of the other *potatoes*. We have heard a great deal of the famishing poor of those countries, and particularly of the latter—of the misery and wretchedness seen in every hovel; and there cannot be a doubt that famine walked through the land, when the blight and rot despoiled them of their potato crop, on which, for so long a period, they depended as the great article of food. Now, allowing all this—allowing, in the *best seasons*, the chief article of subsistence has been potatoes for breakfast, dinner, and supper; glad, indeed, many of them to get a little animal food once a week to dinner, or even far more seldom—I now ask, what number, in the thousands of emigrants from that country who yearly arrive at our ports, are there that show a constitution weak, fragile, and wanting in physical strength? Many, no doubt, arrive worn down by disease and suffering, and in the last stage of debility; but let them recover from that state, and the robust frame and healthy constitution will be again developed; the bones are strong, the teeth undecayed, and the muscular energy only wanting opportunity to display itself;—in fact when we wish to denote strength in woman, we use the familiar phrase, 'strong as an Irish woman;' and all this from being reared on *potatoes*. But then, if we examine the analysis of the potatoes, we shall find contained in 100 parts of dry potatoes—

Carbon.....	41·1
Hydrogen.....	5·8
Nitrogen... }	45·1
Oxygen..... }	
Ashes.....	5·0

"Here we see that potatoes not only contain the nutriment, but the earthy constituents.*

"But we have a stronger and more healthy race yet, from Scotland and the north of Ireland, who are generally descendants of the Scotch, and continue, in a great measure, the same means in rearing the young. Now, a principal, I will not say *the* principal food of the youth of Scotland, high and low, rich and poor, except in the larger cities, among those who class themselves as more refined and more civilized, but who number few in proportion, consists, for breakfast at least, of oat-

* According to a memorial presented to the French Minister, on the proportions of nutriment of the means of living, by Dr. Glaser, we find potatoes taking no mean rank.

NUTRITIVE ELEMENTS.

100 lbs. Wheat Bread	contains 30 lbs.	
" Flesh	" 21 lbs.	
" Fresh Beans	" 80 lbs.	} casein and starch.
" Peas	" 83 lbs.	
" Lentils	" 94 lbs.	
" Potatoes	" 25 lbs.	} albumen, starch, and sugar.
" Carrots	" 14 lbs.	
" Beets	" 8 lbs.	

meal—that is, porridge and milk; and milk, potatoes, and wheaten, oaten, and peas bread, or *bannocks*, at other times of the day. Animal food among the poor is a rarity; a meat dinner on Sunday *only*, being common. Even among the youth of the better class, butcher's meat, or animal food, is by no means a principal article of subsistence. And I would particularly remark that *Scotch oatmeal* (the oatmeal generally used throughout Scotland) is coarse, and contains much of the bran which invests the oat—containing, as it does, a large proportion of the earthy constituents required for the production of bone. Analysis of 100 parts of dried oats gives—

Carbon.....	50.7
Hydrogen	6.4
Oxygen.....	36.7
Nitrogen.....	2.2
Ashes.....	4.6

“I may here casually remark, that the advantage to be derived from this wholesome food has not escaped the observation of her majesty, Queen Victoria, who appears, in the multiplicity of her public duties, not to lose sight of the equally sacred duties of a mother—and we hear of her son, the heir to the crown of Great Britain, being as fond of his oatmeal porridge as the meanest peasant child in Scotland.

“I rather doubt if parents generally have given to this subject the attention to which it is entitled. I trust, however, that those who have followed me thus far, may be impressed with its importance. We cannot shut our eyes to the complaint which so generally prevails, of decayed teeth—and a moment's reflection will call to mind the number of the young and beautiful who are prematurely hurried to the tomb, ere yet the bud has expanded into the full-developed flower. Nay, comparing the two countries, the statistics of life and death communicate to us also the important fact, that while the greatest mortality shows itself in England in infancy and childhood, on this side the Atlantic it is found at a more mature age.

“Neither has the tendency of the physical organization of woman on this continent to degenerate, escaped the observation of one of our greatest medical philosophers in this country,* who regards this retrogression as a national calamity, and impresses upon his students the importance of the subject, and the propriety of their attention in attempting to arrest it; and he particularly specifies the great object to be gained in the use of bran-bread, made from unbolted flour. On this head I shall have more to say hereafter.

“With these observations, let us now direct our attention to what can be offered in remedy of this evil.

“We have already stated, that in no country in the world are children more beautiful or more lovely—healthy in complexion, quick, smart, and intelligent—active, sprightly, and playful in their disposition. Now, in the period from infancy until the child becomes mature—let us, at all events, say until thirteen or fourteen years, and even to a more advanced age—there is a continued growth—a continual deposition of organic and inorganic or earthy particles, which are required for the formation of

* Dr. Jackson, of Philadelphia.

bone, teeth, flesh, and every part of the human body. I have shown you that the essential ingredients for these several formations are all found in the milk of the mother; consequently, as long as the infant is deriving nourishment from the mother, she ought to partake of good, wholesome, nourishing food—that the blood, deriving these principles from the food, may be able to supply them in turn to the milk from which it is secreted. So long, then, as the child is thus nourished, so long is it safe, and the rudiments or foundation of a robust frame is laid. And if we are to expect, in future life, the stalwart frame of man, or the enduring, firmly-knit, compact, and healthy physical constitution in woman, the organic and inorganic or earthy compounds of which that frame is composed must not be denied—Nature must be supplied, or Nature will fail.

“It is not for me to dictate to any parent what shall be the food of his child—it is enough that I point out for their information what may be required to give, what in common language is called ‘bone and sinew,’ to their offspring. It is necessary then that the food of children shall contain—

“1st. Aliment having the *calorific* or heat-sustaining principle. And this is contained in quite sufficient quantity in the usual food—in milk, wheaten bread, potatoes, arrow-root, Indian-corn (as mush, hominy, corn-bread), in most vegetable matter, and in sugar.

“2d. Aliment containing the *nutrient* principle. And this is contained in animal food—the lean of beast, bird, and fish—in milk, eggs, wheat, rye, potatoes, beans, etc., etc.

“And 3d. Aliment containing the inorganic or earthy constituents—on which depends strength of frame, and from which are formed the bones and teeth of the individual. And these are contained in milk, eggs, animal food, and particularly in wheat, rye, oats, potatoes, etc.*

“Of the inorganic constituents contained in wheat (and the same may be said of the other *cereal* grains), I have already alluded to the benefit

* On this subject, I extract the following from Carpenter's Physiology, p. 488: “These substances are contained, more or less abundantly, in most articles generally used as food; and where they are deficient the animal suffers in consequence, if they are not supplied in any other way. Thus, common *salt* exists, in no inconsiderable quantity, in the flesh and fluids of animals, in milk, and in eggs; it is not so abundant, however, in plants; and the deficiency is usually supplied to herbivorous animals by some other means. *Phosphorus* exists also in the yolk and white of the egg, and in milk—and it abounds not only in many animal substances used as food, but also (in the state of phosphate of lime or bone earth) in the seeds of many plants, especially the *grasses*. In smaller quantities, it is found in the ashes of almost every plant. *Sulphur* is derived alike from vegetable and animal substances. It exists in flesh, eggs, and milk; also in the azotized compounds of plants; and (in the form of sulphate of lime) in most of the river and spring water that we drink. *Iron* is found in the yolk of egg, and in milk, as well as in animal flesh; it also exists in small quantities in most vegetable substances used as food by man—such as potatoes, cabbage, peas, cucumbers, mustard, etc. *Lime* is one of the most universally diffused of all mineral bodies; for there are few animal or vegetable substances in which it does not exist. It is most commonly taken in, among the higher animals, combined with phosphoric acid: in this state it exists largely in the seeds of most grasses, and especially in wheat flour. If it were not for their deficiency of *lime*, some of the leguminous seeds (peas) would be more nutritious than wheaten flour; the proportion of azotized matter they contain being greater. A considerable quantity of lime exists, in the state of carbonate and sulphate, in all hard water.”

to be derived from using bread made of unbolted flour. On this subject, allow me to refer to the difference of flour having much of the bran remaining, and superfine flour, or that in general use throughout this country, and on which Prof. Johnston has made the following curious but practical observations. Examining wheat and flour, as to the amount of the nutrient or muscular matter, the fat-forming principle, and the bone and saline material, contained in grain in different states, he found that—

	Muscular Mat.	Fat Prin.	Bone & Sal.
In 1000 lbs. of whole grain.....	156 lbs.	25 lbs.	170 lbs.
“ “ fine flour.....	130 “	20 “	60 “
“ “ bran.....	.....	60 “	700 “

“Taking the three substances together, according to Prof. Johnston, of a thousand pounds, the three substances contain, of the ingredients mentioned—

	Whole Grain.	Fine Flour.
Of muscular matter.....	156 lbs.	130 lbs.
Of bone material.....	170 “	60 “
Of fat.....	28 “	20 “
	354 lbs.	210 lbs.

“Accordingly, the whole grain is one-half more nutritious than fine flour.* It also shows the very great proportion of *bone material*—that is, *earthy constituents*—contained in the bran: no less than 700 out of 1000 parts, or a *little more than two-thirds* of the whole. Now, by reference to the same work, we find, in a communication from a Mr. Bentz, the difference in weight of a barrel of flour, without the bran, and when only the outer coating of the wheat is taken off. He says: ‘The weight of the bran or outer coating would, therefore, in the common superfine flour, constitute the *offal*, weighing only $5\frac{1}{4}$ lbs. to the barrel of flour, while the ordinary weight of offal is from 65 to 70 lbs. to each barrel of flour; showing a gain of from $59\frac{3}{4}$ to 65 lbs. of wheat in every barrel of flour.’ Now, if we estimate the earthy constituents to be two-thirds of the offal or bran, we must consider that there is an actual loss of these important constituents, which might be reserved, in every barrel of flour, of 40 lbs.

“Again, if we estimate (according to the average of the consumption of flour to the amount of population, as one barrel to each individual) that every child shall consume annually only half a barrel of flour, then we find, that by the use of the superfine flour, as commonly used in families, the child is deprived yearly of twenty pounds of those earthy substances which are required to form the bones and the teeth. When we speak of a child consuming half a barrel of flour annually, it appears a large quantity; but when we reduce the same to a daily allowance, we find that it is little more than 4 oz. or $4\frac{1}{3}$ oz.; and every parent must know that this would be a very small amount to limit children. Yet we see how large a quantity of the bony material would be added, if unbolted flour was used instead of the present superfine flour. I may here add, that the oatmeal used in Scotland, already referred to, contains the bran or inorganic constituents, while the oatmeal used in England is deprived of it. Now this is a great loss of the most valuable constituents in only

* Patent Office Report, 1847, p. 116.

one of the principal articles of the food of children; and if we allude to another article, which is largely used on this continent—I mean Indian-corn—and I may also add the fat of meat, both of which, children, if allowed, will partake of very freely), we shall find that both of these abound more in the calorifacient, or heat-sustaining principle, and for the deposition of fat, than the nutrient; and that they are quite deficient of the earthy material, *of lime*—that material on which so much depends the proper structure of the teeth. Analysis of Indian-corn shows the following composition, as taken from Mr. Salisbury's prize essay, read at the New York Agricultural Society, for 1849:

WHOLE KERNEL.	
Starch	50.64
Sugar and Extractive.....	7.46
Sugar.....	1.50
Fibre.....	6.28
Matter separated from Fibre.....	0.05
Albumen.....	8.64
Caseine	1.70
Gluten.....	4.56
Oil.....	4.00
Dextrine or Gum.....	4.84
Water.....	10.22
	<hr/> 99.89

ASH OF THE KERNEL CONSTITUTING ABOUT TWO PER CENT.	
Carbonic acid.....	a trace.
Silicic “	1.450
Sulphuric “	0.206
Phosphoric acid.....	50.955
Phosphate of Iron.....	4.355
Lime.....	0.150
Magnesia.....	16.530
Potash.....	8.286
Soda.....	10.908
Chloride of Soda.....	0.249
Organic acid.....	3.400
	<hr/> 97.000

“This is a most elaborate analysis—far more minute than any analysis we have had of any of the articles of food—in fact, more minute than satisfactory; for the analysis of the whole kernel does not exhibit any amount of inorganic constituent; and when the whole was converted into ashes, we find that the *lime* only amounts to the *one-sixth of one part* in a hundred. Now, on inquiry, I find, on the authority of a very intelligent miller of this city, that in grinding corn, the bran, or thin skin of the grain, is detained in forming it into corn-meal; consequently, it is deprived of even that portion more particularly containing the earthy constituents. This gentleman, in conversation, mentioned an important fact relative to this deficiency of lime in corn. To the best of my recollection, he observed, ‘This stands to reason; for, ten years ago, all the lower part of Jersey grew excellent corn, but would not grow wheat; but since the introduction of *lime* as a manure, they have raised considerable wheat crops.’ Now the fact is, it is not the habit or food of this plant, even had *lime* been in the earth; and magnesia and the saline manures are recommended to the agriculturist as best suited for its proper development.

"It is generally looked upon as invidious, and one is more likely to incur odium than to receive credit for saying one word against a food which stands so high in public estimation, and is so universally used over this continent. Yet it must not, for one moment, be supposed that I condemn the use of Indian-corn, in its various forms of mush, hominy, bread, or pudding, as an article of diet: far from it. But containing, as it does, a large proportion of starch and fatty matter, rather a small proportion of the nutrient principle, and quite a deficiency of the inorganic or earthy constituents, I consider it as valuable, as a light diet, for heat-sustaining purposes only, and therefore a desirable adjunct *to other food*, containing more nutriment and a due proportion of earthy constituents.

"As an example or illustration of the want of the nutrient principle in corn or corn-meal, I may here allude to the effects I have seen in the West Indies; where, in a dearth of the ordinary provisions on which prisoners were fed, corn-meal was substituted; corn-meal and salted herrings, fish, etc., constituting their food. Now the effect was, that all the prisoners lost their natural strength; at the same time, they became fat and bloated, inclining to dropsy: and this was not the effect of incarceration; for the prisoners were engaged in road-making, trimming, fences, etc.; consequently, in a healthy and exhilarating employment.

"In reference to our domesticated animals, it may be asked, Why is corn so useful, as an article of food, to animals generally—horses, hogs, sheep, etc.? I have already shown that the overplus of the calorific food, after what may be required for sustaining the temperature, is stored away in the form of fat. Now, if we instance the horse: corn is generally, if not always, given as an adjunct to his more usual food, hay. And we find by analysis, that grass or hay contains not only the nutrient principle, but the inorganic constituents required in the formation of bone, etc.

"One hundred parts of dry hay contain—

Carbon	45·8
Hydrogen	5·0
Oxygen	38·7
Nitrogen*	1·5
Ashes†	9·0

100

"Thus, the hay gives to the animal strength in bone and muscle, while the corn supplies the additional heat-sustaining properties, and lays by, in the form of fat, the overplus as a reserve. The harder the horse is worked, the more corn he can bear; the great proportion of the carbon being carried off by the lungs, and the hydrogen and oxygen, as water, in exhalation and perspiration. But if the same quantity is given to a horse at rest, it overloads him with fat, which, in his case, accumulates more internally, or around the internal organs, and will, in the course of time, induce disease; while in the pig, under similar circumstances, the fat is laid on externally, if I may so speak, giving the rich, fat pork of our markets. And here I would again remark, that no farmer would consider it necessary or essential to give corn to a young colt or horse, until required to work; nay, so careful is nature, in appropriating just so much and no

* Fifteen pounds of such hay, containing oz. 3·095 of nitrogen.

† These ashes having a good proportion of lime.

more of any constituent that may be required, that the food of the young horse should be more nutritious than heat-sustaining; and that there shall be no superfluity to store away fat, we find by analysis, that the milk of the mare has little or no butter, in fact only traces of it, in its composition.* What a lesson in the animal economy is here given, and what a practical illustration of the requirements of the young of that and other animals!

"Again, it may be contended, that among the beautiful children we see on every hand, there is no want of those who are fat and hearty. It is not *fat* we want—it is bone and muscle—with so much fat only as shall give firmness to the flesh and plumpness to the figure. Fat, although it enters intimately into union with the other component parts of bone and muscle, cannot be transformed either into the inorganic constituents of bone or teeth, or into muscular fibre; these must be contained in the food consumed, in the first place, and thence transferred to the blood.

"How necessary, then—how important it is—if we expect to give strength and vigor to the constitution, that the food, in the first years of infancy and childhood, when the formative process is going on, should receive some further attention than has hitherto been given to it; and if our youth—if our young females have hitherto been deprived of the necessary constituents for the full development of every portion of the body—can we wonder that a woman should be the delicate and fragile being she is, or that by the decay which assails the teeth in early life, she should be deprived of an ornament of so much value? If this state of things can be altered—if the physical constitution of woman in America can be saved from further degeneracy—a purpose may be effected, of consequence even in a national point of view; for it is to the healthy and vigorous constitution of woman that we must look for a race of hardy, vigorous and enterprising freemen.

"In conclusion, I would briefly state, that this is a matter in which professional aid can avail little; it lies at the door, and must be the work of parents generally. It is for them to understand the great value to be attached to the food on which their children subsist—that it shall be wholesome and nutritious, and abounding in the earthy compounds so absolutely necessary to their proper development. If the chief articles of food have hitherto consisted of compounds made of superfine flour, corn-meal, and the fat of meat, let there be substituted in their stead, bran-bread, milk, eggs, the lean of meat, and potatoes; let more attention be given to the nutrient quality of the food;—let there be no deficiency of those articles containing the earthy material, that the bones and teeth shall not be deficient in those constituents so necessary in their composition and structure; and I should be inclined to hope that the evils which now exist will be lessened, and the physical organization of succeeding generations be equal to that of any nation upon earth."—(*Med. and Surg. Reporter.*)

* ANALYSIS OF MARE'S MILK.

Water.....	896.3
Butter.....	Traces.
Caseine.....	16.2
Sugar of Milk, Extractive Matters, and Fixed Salts.....	87.5

1000.

Form of Cranium.—"It is pretty generally allowed, equally, we believe, by monogonists and polygamists, that man, wherever found, whether within the polar circle or the tropics, whether civilized to the highest degree yet reached, or in the lowest stage of civilization, is organically similarly constructed, is capable of interbreeding,* has like passions and propensities, and from birth to life's terminus runs a like course, observes the same stages, his time of puberty the same, of maturity the same, and the average duration of life much the same, when not cut short by diseases, and these common to all.†

"While these points of resemblance are admitted, others are insisted on denoting differences, such as the form of cranium, the quality of hair, the color of the skin, etc.—differences held by some to point to difference of species; by others to be valueless as distinctive characteristics of race.

"Mr. Dunn is the representative of those who hold the latter opinion. In a former paper—one published in the fourth volume of the 'Journal of the Ethnological Society'—he has endeavored to prove, and we think with some success, that little stress can be laid on diversity of cranial form as regards difference of race, his argument being that typical forms are convertible, 'under the varying influence of outward circumstances of civilized states.' We would rather insist that these forms are more or less mixed in every people with whom we are well acquainted, and in no people is one type unexceptionally met with. Who that has examined a large collection of crania, containing specimens of those of the Caffre and Hottentot, of the Australian and Tasmanian, has not found individual examples which bear, at least in the well-developed frontal bone and the general shape of the calvaria, a close resemblance to the best specimens of the Caucasian cranium? The experience of our farmers should, we think, teach us to place little reliance on mere form. They know by experience how, by selection and cross-breeding, the shape of the head and its appendages can be varied. In the human race, we have an instance in the Turks of great change of the general form of features by the like process, with the addition, perhaps, of influence of climate and diet.‡ In no feature does the existing race resemble that of the Mongolian stock from whence it was derived; and the same remark is applicable to the Hungarian Magyar. The facial bones, the maxillary, malar, nasal, are, we are inclined to consider, more distinctive than the cranial. The prognathic form is rarely met with, except in the wildest and rudest

* It has been asserted that the Australians and Tasmanians are an exception, and that even the circumstance of their women cohabiting with Europeans has resulted in rendering them barren, in case of after-marriage with men of their own race. Both these assertions—the latter of which has given rise to strange hypotheses—have, we think, been amply disproved.

† The African negro, it has been said, differs from the European in being exempt from yellow fever and ague—a statement true to a certain extent; the acclimatized are, in a great measure, exempt; but, if otherwise, if they come from a cool region to a hot, as from Canada to Demerara, or other places, when infected, within the tropics, they are not secure from attack.

‡ We are disposed to think that the quality of diet may have an influence, if not on the size of the cranium, at least on the thickness and weight of the bony case. In a letter before us, written by a friend in Dublin, he makes mention of a good collection in that city of high-caste Indian crania, from the rice-eating districts, which are all very small and light. If the food should contain little phosphate of lime, ought we to expect large and heavy bones?

racés; while the orthognathic is seen to predominate in various races, widely apart, who have made some progress in civilization.

"Should these remarks be objected to, as too vague and general, we would refer to the recent observations of two distinguished physiologists, Retzius and Rudolf Wagner—the one on the form of crania of different races, the other on the weight of the brain: the one giving examples of similarity of shape of head of peoples most widely apart, and by some supposed to be distinct species, such as the African negro and the majority of Europeans, both of the dolicocephalous type; the other showing that it is an error, as maintained by many, that men of superior intelligence have proportionally large brains, or exceeding the average weight."—(*British and Foreign Medico-Chirurgical Review.*)

Fossil Teeth of Horse.—At a recent meeting of the Philadelphia Academy of Natural Sciences (*Proc. of Acad.*), "DR. LEIDY exhibited some bones and teeth of horses from California and Oregon, recently submitted to his examination by Prof. J. D. Whitney. He stated that fossil remains of horses had been found throughout the length and breadth of the North American continent. They had been obtained from the frozen cliffs of Eschscholtz Bay in Arctic America, and from Honduras in Central America; from New Jersey, Pennsylvania, Maryland, Virginia, North and South Carolina, Georgia, Kentucky, Mississippi, Louisiana, Missouri, Nebraska and Texas. Many of the remains are undistinguishable in anatomical character from corresponding bones and teeth of the domestic horse; others are comparatively large, though not larger than in the largest variety of the latter, but their molar teeth exhibit a more complex folding of the enamel than is seen in the domestic horse. Dr. L. considers it probable that the fossils represent several extinct species, all differing from the living horse, though this was not a matter of demonstration.

"Most of the remains from California, among them an entire skull, are unchanged in appearance, and are undistinguishable from corresponding parts of the mustang, or recent Indian horse of the West, though taken from auriferous gravel a considerable depth from the surface.

"Among the California specimens are several molar teeth having more the general appearance of true fossils than the others, though they are also but slightly changed. Two of them are second upper molars from different individuals, of more robust proportions than any of the recent looking specimens, and equal in this respect to the corresponding teeth found anywhere. One of the teeth was taken from auriferous clay at a depth of thirty feet below the surface, in Tuolumne County, and is slightly infiltrated with oxide of iron. The other was obtained from a bed of asphaltum, in company with a last lower molar, near Buena Vista Lake, and is impregnated with bitumen. These two upper molars, strongly resembling each other, differ from the more recent looking specimens, and from the corresponding teeth of the domestic horse, in the remarkable degree of simplicity of the enamel folding, as seen on the triturating surfaces. They differ in another circumstance, which is perhaps accidental, or at least was dependent on the peculiar character of the food, that is to say, the triturating surface, in both specimens, is remarkably flat, whereas in the horse ordinarily it is worn into two transverse hills. Dr. L. was disposed to view these teeth as representing a species different from any heretofore indicated, and proposed for it the name of *Equus occidentalis*. The

measurements of the specimens are as follows : Antero-posterior diameter of triturating surface $14\frac{3}{4}$ lines, $15\frac{1}{4}$ lines ; transverse diameter of do. $12\frac{1}{2}$ lines, $13\frac{1}{2}$ lines."

"A Parasite in Bone.—PROFESSOR WEDL, in examining some bone and teeth sections of Professor Heidel's, has discovered that the minute cavities of these hard tissues are very frequently invaded by a species of microscopic fungus. The spores are widely spread through the lacunæ of the cementum and the tubuli of the dentine of teeth, but they are not found in the enamel. This fact has been proved by repeated observations. The parasitic growths appeared to be developed at the expense of either the organic or inorganic matter of the teeth and bones ; furthermore they are never found in tissues freshly prepared, nor have they any connection with the diseased condition known as caries."—(*Lancet.*)

"Termination of Nerve-Fibres.—Notwithstanding the able refutation of Herr Kühne's opinions which was given in Dr. Beale's 'Croonian Lectures,' the continental *savant* reiterates his conclusions as to the mode in which the nerve-fibres terminate in the muscles. He asserts that the cones in which the nerve-filaments end do not contain a trace of the medullary matter of the nerve. According to MM. Schulke and Rudneff, an aqueous solution of osmic acid gives the medullary a blackish tint. Availing himself of this fact, Kühne added this compound to some microscopic preparations in which the nerve-fibre, the *cone*, and the muscle were shown ; and he perceived that while the fibre itself was blackened up to the point of union with the *cone*, the latter and the muscular substance in which it lay presented a yellow color. This fact he regards as an overwhelming proof of his theory. He recommends transverse sections of the muscles as best calculated to show the arrangement he describes. In order to procure them in the fresh condition, he freezes the recently-removed muscle, and then prepares his sections with a razor which has been cooled to the freezing point. In this way he obtains very delicate specimens, consisting of two or three layers of the sarcoous elements, and in which the nervous 'plates' exhibit themselves as brilliant but irregularly-shaped particles."—(*Ibid.*)

Origin and Circulation of Nerve Force.—"DR. STRACHAN (*Edinburgh Medical Journal*, August) has started an hypothesis respecting 'the origin of nerve force,' which we think deserving of notice, inasmuch as it is, at all events, as good as any other hitherto put forth, while it dovetails very well with the anatomical facts recently announced as to the completeness of the circuit formed by any one nervous filament proceeding from and returning to a ganglionic centre. Dr. Strachan suggests that taking the formation of a galvanic current as the probable analogue of the origin of the force, the latter generated in the capillary vessels by the combination of oxygen with carbon and hydrogen, and by the other chemical actions there constantly going on, that the nervous filaments distributed upon the capillary vessels, and especially the clear fluid in the centre of each tubule, constitute the conductors of the force, which running its circuit to the ganglionic centre and back returns to the same place from which it set out. Thus he regards the circulation of the blood and of nerve force as mutually dependent on and influencing each other.

He suggests, further, a process of induction between different nervous circuits similar to the induction known to take place in certain galvanic combinations, and would explain in this way apparently the phenomenon of reflex action. The hypothesis is ingenious, and well worthy of experimental investigation. Dr. Strachan, however, is not the only person who has seen the adaptability of the galvanic hypothesis to the explanation of nervous currents, especially that form of it which, dispensing with the notion of an 'electric fluid,' explains the phenomena of chemical decomposition in the circuit by the establishment of a series of chemico-polar elements. Until the demonstration recently made by Dr. Beale, however, to which we drew the attention of our readers some months ago, anatomy gave no sufficient sanction for announcing such an hypothesis as that of Dr. Strachan. We believe that he is upon the right track, and hope that either he or somebody else will follow it up."—(*Med. Times and Gaz.*)

"*Danger of Subcutaneous Injections.*—PROFESSOR NASSBAUM, of Munich, has just published an interesting account of an accident which happened to himself. Suffering from neuralgia, he had injected morphia under his own skin more than 2000 times—sometimes to the extent of five grains of morphia in twenty-four hours. Two months ago, he injected two grains of acetate of morphia dissolved in fifteen minims of water, and accidentally sent it direct into a subcutaneous vein instead of into the cellular tissue. He gives a graphic account of his dangerous position for two hours, after which the effect passed off. He has seen similar effects in a smaller degree in two of his patients, and the practical lessons are, that as it may be impossible to avoid veins at all times, and one may be punctured unawares, subcutaneous injection should always be done *very slowly*. The effects are so instantaneous that the syringe can be stopped at the first sign of danger, and some of the injected fluid mixed with blood may even be sucked out again by the syringe. It is very remarkable how the effects of the same dose of the same substance differ when directly injected into a vein and mixed with the venous blood, and when they filter into the blood from the cellular tissue through the unbroken coats of the vessels."—(*Ibid.*)

"*Soft Sarcomatous Tumor of the Antrum of Highmore.*—At the meeting of the Pathological Society of New York, November 8th, Dr. KRAKOWITZER related an interesting case of tumor of the antrum, of which we give the substance.

"The patient was a young man, 25–26 years of age, who six years ago had been an inmate of the Jews' hospital. He was then laboring under ozena, a discharge taking place from both nostrils, which were ulcerated and covered with crusts.

"The treatment consisted in removing the crusts, cauterization of the ulcerated surfaces, and the use of mild astringent injections. In the minutes of the case it was stated that he had had hæmoptysis, and that a severe attack of bleeding had followed after probing the nasal passages. There were no hereditary taints traceable.

"During the last year he had been engaged as a conductor on a railroad. One night in December last, while following this avocation, he

stepped from a warm car upon a platform and unbuttoned his coat. Three days afterward he was seized with violent bleeding from the left nostril. The hæmorrhage stopped, but from that time he commenced to notice difficulty of breathing through this nostril, which difficulty gradually increased until about three months ago, when the passage had become entirely impervious, and the patient, by introducing his little finger, could feel a tumor descending down the nostril. In July, about six months after the first, another severe hæmorrhage occurred, upon which the tumor receded, and he could feel it no longer in the nostril. Soon, however, a swelling made its appearance on the inner canthus of the left eye, increasing until it pushed the eyeball outward, to such an extent that the eyelids barely covered the eyeball, which, however, was movable, and the eyesight remaining good. The patient at this time had settled at Warrenton, Va.

"Dr. Krakowitzer saw the patient a week ago. He seemed to be in perfect health, felt perfectly well, and had never suffered any pain from the swelling. The whole of the left side of the face was a little protruding. In consequence of the bulging out of the eyeball, and pressure upon the lachrymal apparatus, there was constant epiphora. On examining the left superior maxilla it gave to the touch a sensation of softness and elasticity. No swelling could be detected in the nose. The soft palate was normal. There was no affection of the submaxillary or of the cervical glands. On pressure the inferior margin of the orbit could be felt intact. Since his arrival in New York the patient has had three attacks of hæmorrhage from the nasal passages, of considerable severity.

"There could be no doubt of the presence of a tumor. In regard to its character the opinion was formed that the new formation was not malignant. Its growth had evidently not been very fast, and there was an absence of pain and no infiltration of the neighboring glands.

"The next point to be decided was regarding the origin of the disease. The patient stated distinctly that the tumor at first presented in the nasal cavity, and that with its recession from that locality it could be detected in the angle of the eye. The general aspect of the face, and the soft elastic feel, pointed to the antrum of Highmore as the seat of the disease. The first development probably took place toward the nose; then, with its advancing growth becoming disengaged, it was lifted back, toward the orbit, and the anterior walls of the antrum became gradually absorbed. It was presumed that there were no adhesions with the base of the skull.

"The removal of the tumor was decided upon, and the operation performed in the usual manner of extirpating tumors involving these parts. The whole of the antrum was found filled with the mass. In removing the soft fragments of the growth extending toward the base of the skull, it was found that *bony absorption had taken place here*, and at one point so completely that the *dura mater was visible*, and the pulsations of the brain could be seen.

"The tumor, as had been anticipated, belonged to the soft sarcomatous variety, not exactly malignant, but still apt to recur, especially in this region. The prognosis in this case is that the patient will die of meningitis.

"Under the microscope the main characteristic element of the tumor, which on account of its softness could not be removed *en masse*, but had to be taken away in fragments, consisted of elongated circles with one single nucleus."—(*Med. and Surg. Reporter.*)

Epithelioma. Reported by J. W. P. BATES, M.D. Surgical Clinic Prof. R. N. SMITH, M.D., University of Maryland.—Man, 47. A well-marked case of cancer of the lip, not suppurating in a healthy way, everted edges, extreme hardness and aching and burning; never had much lancinating pain, which is the kind generally felt in this disease. Had it since April. Small tumor under the jaw, opposite to this sore on the lip—had it since he was 21 years of age, therefore not connected with this disease. The involvement of the glands unfavorable indication. He has been in the habit of smoking a pipe—formerly used it on the right, but, on account of this sore, changed to the other side. In a large majority of instances this disease is the result of tobacco. Often see it in negroes—a short pipe more likely to produce it than a long one, because more of the oil of tobacco is imbibed. Cigars and chewing also produce it. Knew of a case where the disease commenced in the cheek, from the action of a quid of tobacco; in another case, an inveterate smoker, the disease made its appearance on the tongue just where the stream of smoke impinged. Epithelioma is cancer modified by the tissue it affects. It sometimes appears on the face, and may be mistaken for tetter—a little scab appears, peels off, and leaves a sore which soon develops the cancerous nature. The only remedy is excision of the diseased mass. In this case we will remove part of the lip by a semicircular incision and dress with lint, and let it heal by granulation. Sometimes a V-shaped piece is removed and the parts brought together, but that always produces tension and puckering.”—(*Ibid.*)

Salivary Calculi.—DR. HODGES reported the following case to the Boston Society for Medical Improvement: A patient, 25 years old, entered the Massachusetts General Hospital for a tumor beneath the ramus of the jaw, of twelve years' standing, hard, movable, and from which no inconvenience had been experienced until six months before her admission, when it became painful, enlarged, and easily felt within the mouth at the side of the tongue. It discharged a watery fluid at first, which subsequently became purulent. Every now and then the tumor would enlarge, the discharge cease for a short time, and then break out again, with relief. An incision at the side of the tongue permitted the release of two salivary calculi—one the size of a grain of wheat, the other not larger than a mustard-seed. The incision healed rapidly, and three months after the operation the patient was seen, and found to have been relieved entirely from the periodical attacks of swelling, while the tumor was rapidly disappearing.”—(*Boston Med. and Surg. Journ.*)

Animal Grafts.—M. P. BERT gives to the French Academy further accounts of his remarkable animal grafts, such as making the tail of a rat grow on another creature. The end of the tail is skinned and introduced in the subcutaneous tissue. An effusion of plastic fluid takes place, and fibres soon appear. On the fourth or fifth day, capillary vessels have united the vessels of the graft and the creature in which it is placed. At a later period these vessels become larger. In the course of twenty days the muscular fibres experience fatty degeneration. The nerves exhibit a double process of degeneration and regeneration. The bony and cartilaginous parts undergo little change. If the tail is a young one it completes its growth in its new position, and may even surpass the dimensions it would have normally reached.”—(*Intellectual Observer.*)

“Notes on the Fracture of Polished Glass Surfaces.” By F. H. WENHAM.—The short communication which I submit to your notice scarcely merits consideration as a discovery; but as the microscope has in this case immediately detected the cause of a well-known phenomenon, I bring it forward as an example of the use of the instrument in practical investigations.

“It is a fact known to the philosophical instrument makers, that if a metal wire be drawn through a glass tube, a few hours afterward the tube will burst into fragments. The annealed glass tubes used for the water-gauges of steam-boilers are sometimes destroyed in this way, after the act of forcing a piece of cotton waste through them with a wire for the purpose of cleaning the bore. This will not happen if a piece of soft wood is employed.

“The late Andrew Ross informed me that on one occasion, late in the evening, he lightly pushed a piece of cotton wool through a number of barometer-tubes with a piece of cane, for the purpose of clearing out any particles of dust. The next morning he found most of the tubes broken up into small fragments, the hard siliceous coating of the cane proving as destructive as he had previously known wire to be.

“After having drawn the point of a steel burnisher over the surface of a slip of polished glass, the following appearances will be observed under the microscope, using the polarizing apparatus and selenite plate, with a two-thirds object-glass. A colored stripe is visible in the passage of the burnisher, showing that the surface of the glass has been placed in a state of tension in the direction of the line. The glass, too, seems not altogether devoid of plasticity, for the waves of color show that it has been carried forward in ripples, resembling the mark left on a leather-bound book after the passage of a blunt point. It may be inferred from this that the mere burnishing of the surface of the glass with a substance inferior in hardness will, without any scratching, cause an irregular strain in the bore of tubes sufficient to split them, and the concussion attendant upon the fracture often reduces the tube to small fragments.

“If the burnished lines upon the glass slip be examined a few days afterward, the colors will have become much less visible, showing that the strained portion of the glass partly recovers its equilibrium.

“On attempting to polish out a minute scratch on the surface of a piece of glass it sometimes appears to widen during the process, and at length resolves itself into two irregular parallel rows. Also, a clean cut made with a diamond on a piece of plate-glass, if left for a time, the surface in the vicinity of the cut will break up, forming a coarse irregular line. If the diamond be raised and struck lightly on the surface of the glass, the form of the edges of the short stroke thus made may be plainly seen, using the binocular polariscope. A conical ridge of glass appears to be left with its apex under the line of the cut, and the glass is frequently wedged up on both sides of the ridge, explaining the cause of the double line of fracture which sometimes makes its appearance in polishing out a scratch. This effect may also be exemplified by observing the marks left on a polished glass surface from the light blows of a steel centre-punch. The point of the punch drives in an atom of the glass, and the fracture extends some distance into the interior, expanding downward in the form of a truncated cone. The polariscope shows that the conical centre is in a state of compression, and that the surrounding exterior portion of the glass is also under strain.

"The smooth, round edge of a glazier's diamond, when drawn over a polished glass surface, burnishes down and compresses the glass beneath the cut, and in the case of thin sheets the wedge-like force of the compressed line splits the glass nearly through; but when the glass is thick and rigid, as plate-glass, unless the sheet is bent back and broken through immediately after the cut, greater difficulty will be experienced if allowed to remain for a time, for the compressed line of glass will speedily tear up the portion on both sides, leaving a wide ragged groove in place of the original clean and scarcely visible line."—(*Quar. Jour. Microscopical Science.*)

"On the Coloration of Glass by Selenium. By M. PELOUZE.—Some months ago (see *Chemical News*, vol. xi. p. 250) the author showed that the yellow color of ordinary glass was due to the presence of sulphur and sulphides coming from the reduction of sulphates present in some ingredients. He was now anxious to ascertain whether selenium would communicate any, and what, color to glass. Experiment proved that it gives a beautiful orange tint, resembling that of some varieties of topaz, and zircon hyacinth. One per cent. of the metalloid will produce the effect. Thus the analogies between sulphur and selenium extend to their reaction on the earthy and alkaline silicates."—(*Chem. News.*)

"The Most Fusible Alloy.—The most fusible alloy at present in use is a compound of two parts by weight of bismuth with one of lead and one of tin. It is called 'fusible metal,' *par excellence*, by reason of its melting at so low a temperature as 93.75° Centigrade. Dr. C. R. Von Hauer has found, however, that by the addition of cadmium to alloys of bismuth with lead and tin, compounds may be produced which will fuse at a lower temperature still. An alloy of four equivalents of cadmium, with five equivalents each of lead, tin, and bismuth, is quite liquid, he states, at 65.5° Centigrade. In parts by weight this alloy would consist of cadmium 224, lead 517.5, tin 295, and bismuth 1,050. An alloy of three equivalents of cadmium, with four each of tin, lead, and bismuth, fuses at 67.5° Centigrade, and an alloy of one equivalent of cadmium with two equivalents each of these three other metals at 68.5° Centigrade, which is also the fusing point of an alloy of one equivalent each of all the four metals. Dr. Von Hauer made these alloys by fusing their ingredients in a covered porcelain crucible at the lowest practicable temperature. Their melting points were determined—under hot water, and also by placing a thermometer in the fused mass, without water—after they had been melted and cooled several times. They all become pasty at lower temperatures than those given above; the temperatures quoted are those at which the alloys are perfectly fluid. It should be added that, unfortunately, all these alloys very rapidly oxidize when placed in water."—(*Mechanics' Magazine and Sci. Amer.*)

"New Binocular.—HARDWICKE'S *Science Gossip* for the present month contains an account of a new binocular dissecting microscope, designed by Dr. Henry Lawson, editor of the *Popular Science Review*. Its magnifying power is but six diameters, but the field of view is so large, and the relief of the object so well and clearly marked, that the instrument is likely to become very popular among microscopists."—(*Dublin Med. Press.*)

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, JANUARY, 1866.

No. 6.

ORIGINAL COMMUNICATIONS.

THE PAST, PRESENT, AND FUTURE OF DENTISTRY.

BY DR. ISAAC WOOLWORTH, OF NEW HAVEN, CONN.

An Address delivered at the first annual meeting of the Connecticut State Dental Association at Hartford.

Mr. President and gentlemen of the Connecticut State Dental Association:—There is a trite saying, which has passed into a proverb, that necessity is the mother of invention. It is also true, that everything among men has had a beginning. It might be difficult, if desirable, to point you to the first man who conceived the idea, which has resulted in the profession, for whose advancement and perfection we are gathered here to-day. To tell where he was born, what laurels he won, or where he died. Yet it would be most reasonable to suppose, that the practice of examining the teeth, which had become the seat of a mysterious and anomalous pain, and the endeavor to comfort them, must have originated in some urgent want. And I have no doubt that this strange phenomenon must have been regarded as a sore affliction, and might have been supposed to have had its origin with the devil. For the inimitable Scottish bard has since characterized it, in one of his poems, as the “hell of all diseases.” Now it is in perfect keeping with the instincts and habits of man to search out, and endeavor to remove or exterminate, all mortal enemies to his peace or welfare. Hence it is quite reasonable to conclude, that both his ingenuity and reason began early though feebly to operate against the cause of this supreme annoyance—this insidious foe to his peace. There are some scintillations of evidence that attempts were quite early made at stopping those singular holes on the grinding surfaces of teeth, how successfully we are not informed. There is, however, abundant evidence that numerous attempts have more recently been made at plugging teeth, as most of us can testify, with very dubious results. From a very early period, there is evidence that both

lead and gold have been employed, and were, until a very recent date, the only substances used in filling teeth. It is said, however, that the Chinese, centuries ago, possessed a method, now lost, of filling teeth with a substance resembling enamel in color and texture; but of this almost nothing is known. If it was no better, as a permanent stopping, than its modern cousin, os artificiel or bone filling, the world will not crucify itself for its loss. Gold, from its superior hardness and costliness, was not so much employed, in the earlier and ruder stages of our art, as lead. This substance, according to Dr. John Hunter, who wrote in 1778, was more, and almost the only substance, employed at that time, and down to 1833, for this purpose. It might be a little refreshing to the older members present, and a little consoling to some of the younger ones to advert in passing to some of the early struggles and difficulties which attended the pioneers in our noble art as they groped their way along the untried paths which we were obliged to travel. And I do most heartily congratulate my young brothers who enter our ranks under the greatly improved facilities of the present, that they have not to struggle against those formidable discouragements which met us at every step. A most charitable writer has said that he who does the best his circumstances allow, does well, acts nobly, angels can do no more. Many of you, gentlemen, may never know, and I sincerely hope you may never experience those difficulties under which we labored, who once at least stood in the front ranks of our profession. Our worthy President, and those of us whose experience dates back twenty-five or thirty years, can easily recall many performances, for which we would gladly atone, by many years of more useful labors. And this, gentlemen, is the only way in which we can now atone for the past and acquit our consciences before their own tribunal. One of the greatest obstacles in our way in those early times was the utter dearth of instruction in the special requirements of our profession. We had no special literature, very few text-books, no colleges, no public instructors; and one might as well interrogate a Hottentot as to ask questions of a dentist with the hope of gaining instruction—so that the experience of others was of no commercial or interchangeable value whatever. I remember well calling on a dentist in the summer of 1838, well known for his imperious self-conceit, but whose operations had attracted my attention, and awakened in me a commendable desire to see, if I might see, and to hear, if peradventure I might hear, something to my advantage. I was treated with much politeness and courtesy so long as he supposed me a patient. But about the same time he discovered his mistake, I discovered mine, and retired, disgusted, and chilled at his icy selfishness, perhaps a wiser man but no better dentist. But thanks to the progressive genius of our art, those days of darkness and selfishness have, we may fondly hope, forever disappeared, and our noble art, under the fertilizing light of experimental knowledge, and the genial influence of a

more liberal spirit, claims to-day the dignity of a demonstrated science. The dentist of to-day is not the itinerant tinker who might have been seen a few years ago prowling about the country, with a mysterious little box under his arm, containing a few old awls, a few crooked irons, a few leaves of tin foil, and a little nub of seahorse tooth, fixing teeth. He is a gentleman of kind and genial manners, of good education, in fair and honorable competition with the other learned professions, appreciated and patronized by an intelligent and generous public. Instead of being a superfluity among men, he is now the indispensable need of every community. And then, too, compare some of his delicate operations and beautiful structures of the present with some which all of us have met if not actually *perpetrated* in our lives, and see and admire the contrast. Instead of the ivory *shuck* carved out and mounted with teeth of animal origin, actually inhabited from very filthiness and decomposition, to supply the loss of an entire upper or under set of teeth, look to-day at those beautiful triumphs of mechanical dentistry, those splendid mineral teeth, mounted on imperishable platina with continuous gums, the very rival of nature, and those on vulcanized rubber, less beautiful, perhaps, but durable, and worn with great ease and comfort. And then, too, just examine some of those golden gems, golden corners, golden halves, and even golden crowns of teeth put in and put on, yea, and hammered together as solid as the smelted metal itself (with a good Atkinson plugger), and compare those performances, the astonishment and delighted wonder of even the performer himself, with some of those musty and dingy stuffings, which some of us may have seen, and which we hoped might last—at least till the patient had paid his bill and gone. Look, I say, my brethren, on these pictures, not overdrawn, of the past and present of our profession, and rejoice with me that a brighter day dawns, yea, even shines in all departments of our chosen profession. Let us thank God and take courage, that we are permitted to practice in so noble a calling as ours, in this year of grace and of glory, 1865. The past of dentistry has had its uses as well. Had there been no past or point of beginning and departure, there could be no present or point of progress.

A prophet of the nineteenth century might have predicted of dentistry as a valued and honorable profession, as did one of old of a famous and mighty people. "Though thy beginnings be small, yet shall thy latter end greatly increase." The little cloud, no larger than a man's hand, seen floating in the clear sky toward the land of Palestine—parched with drought by the space of three years and six months—continuing to spread until it covered the whole land, descending in grateful showers to refresh and fructify the earth, and gladden the heart of the disconsolate watcher; so, the feeble thought of some humble man, working toward his finger ends, in the interest and behoof of the human family, suffering

perhaps untold horrors for centuries, was the root and origin of one of the greatest blessings to our race, which has been gathering strength and contributions from the thoughts and labors of other minds and other hands, during at least the last half century, till to-day the accomplished dentist is one of the most useful and skillful men in the world. So dentistry, from the smallest possible beginnings, with its little rush-light of literature, flickering and dim, with its few bungling and blundering practitioners, unknown and unheard of by each other, has gone steadily and rapidly on, multiplying in numbers, and growing in grace and accomplishment, increasing in favor with every earnest laborer in the great field of actual development, and with the cultivated and appreciative men and women in all lands, until the horizon of its usefulness and labors are to-day coextensive with the cultivated and civilized portions of the earth. We have now in the interest of our profession several respectable colleges, each with a corps of learned professors, which will compare favorably with the celebrated medical schools in our cities, where clinical instruction is given. We have also periodicals, monthlies, and quarterlies, which bring to the office of every dentist who desires them, the fresh productions and latest developments of a great army of devoted men who are laboring with commendable zeal to develop the resources of a young and thrifty profession, destined to stand in the front ranks of the most beneficent institutions among men.

Having briefly adverted to the past by way of contrast and argument, spoken of the present a little for our edification and encouragement, it remains to me to consider the future prospects of our profession in the light of the past and of the present, and our relations and duties in its development. First, then, what are the needs in this direction, as seen from our present stand-point? One of the first, as it seems to me, is the want of published and oral instruction among the people, nearly all of whom have an interest with us in the immediate future of dentistry. The cause of this want may be found in the fact that dentists, for the most part, are practical men and not theorists or writers; many of them, perhaps, deficient in the literature of their profession, and general literature as well. And our writers and lecturers, physicians, and physiologists, who contribute so copiously to the amount of intelligence among the people on almost every other useful art or science, are altogether silent on this, involving the comfort or convenience of almost every individual in civilized life. Who ever sees or reads an article or paragraph on the teeth? The public press is teeming with instruction, and popular lectures are read on all subjects of interest to the people, many of them of far less importance than those pertaining to teeth. I am aware that it is expected that every specialty in the useful arts or sciences will furnish its own quota of instruction on matters peculiarly its own. I am also aware that dentists have not sought to enlighten the people, by furnishing in-

struction in their special department, who, of all others, should be best qualified to do so. It is not because they have not a literature of their own, nor is it because they have not able and efficient practitioners and writers in their favorite profession who might find both profit and fame by an outspoken and generous promulgation of that knowledge which they alone possess, not of processes and manipulations, peculiar to their practice, of value only to themselves, but of the causes of disease, and means of preservation of those beautiful gems, more precious than rubies, which experience has taught them are not well understood by the people. Such a course would in time give us intelligent patrons who would know what we can do for them, and when to ask our assistance. I cheerfully acknowledge my own remissness in this duty as well as my own inability to do justice to a subject of sufficient importance to enlist the energies of the best of writers, to give to it that demonstration which it justly deserves. I have no more doubt that as greatly an improved condition of the teeth of this generation may be realized by the diffusion and practice of correct doctrines as in anything else. There is no single interest in our country of one-tenth the importance to every human body, that has not called to its aid the scientific, scholastic, and literary energies of our times. Agriculture, which, until recently, was permitted to jog along the beaten track of centuries, without an advance-guard even, is now calling to its aid the most erudite professors, teachers, and writers, together with an experimental host of practical men who are now giving to the oldest pursuit of our race, the dignity of a modern science. And yet no voice is heard, no pen is made to speak to the popular ear or understanding, on the means of preserving the teeth. All that meets the public eye or ear is the flaming card of some new-fledged "surgeon dentist," with the unmistakable odor of a previous business fresh on his garments, and who now offers his valuable services to the public very cheap for cash, etc. etc.

The most attractive thing he would have you notice is the cheapness of his wares. Who ever heard of a skillful man offering his services at a discount? Can you buy superfine flour, or cloth, below the market value of such articles? The surest evidence usually of the quality of a man's services is the value which he attaches to them. There is magic in this word cheap, aye, and deception too; and the cheat is, that some think they are getting a first-rate article at a second or third rate price. Now I am not an advocate for a high tariff of prices which the rich only can pay. But I am in favor of good work at remunerative prices. I have dwelt thus much upon remuneration in our profession because of the great diversity of prices, and quality, and because excellence is the sheet-anchor of the dentist's profession—the great field in which the skillful operator can demonstrate the positive power of our art, to benefit his fellow-men, and to bear us onward to that tri-

umphant future which we anticipate. The unremunerative prices for which such services have been attempted, is the grand reason why so many valuable teeth have been sacrificed.

There is another subject to which I wish to call your attention, gentlemen. I do not speak of it so much as a neglect—for I do not know how culpable others may be in this particular—as I do for its agency in the future of our profession, and for its effect on the teeth of the present and coming generations in this country. That is our personal intercourse with our patients. There is much we can do if we will, besides operations and structures, to benefit those who seek assistance at our hands. In our office intercourse with those for whom we operate, we can drop a word or make a suggestion, or prescribe directly, and urge our prescriptions upon the notice of our patients. This can be done in such a manner as to secure a grateful appreciation of those unselfish and unpaid services. It is said that “words fitly spoken, are as apples of gold in pictures of silver.” How truthfully will this beautiful proverb apply to every dentist who earnestly seeks the best good of his patients, and the advancement of our calling above a mere trade. Speak to the young of the importance of punctual attention to their teeth; encourage in them habits of cleanliness with respect to the safety of those organs from decay. Speak to them of the great detriment, and sure destruction of their teeth, arising from the habit of tasting food and other delicious morsels at all hours of the day, when their systems have no need of nutriment. Tell them that solid and nutritious food is preferable to a thin and watery diet, that teeth are made to eat with—and that all food in a semifluid state which can be swallowed without mastication and thorough insalivation, deprives the teeth of their proper use, and the stomach of a very important auxiliary to complete digestion. Call the attention early of mothers to their children’s teeth. And oh, how early, gentlemen, when it is perfectly understood by every intelligent dentist, and should be known by every married pair, that the foundation of every perfect set of teeth *must* be laid months before their children are born! Be not startled, gentlemen, at this announcement, and this survey of the field of our duties, for the mission of our profession, in its future triumphs over the atrophied and decaying teeth of the American people, unmistakably and imperatively demands of us that we take cognizance of them even in the children who are to *be* born. A beautiful illustration of this doctrine was given to the profession by Dr. Watt, of Zenia, Ohio, at the American Dental Convention which met at Saratoga, N. Y., in August, 1863, of a family, of mother and children, whose dentist he was. The mother was one of those delicate ladies, like many American wives; her first-born was a daughter who inherited her mother’s physique, and slight bony structure, who lost her teeth, and was supplied with artificials at the age of fourteen years; the next two were

sons, at two subsequent births. The mother, by the advice of Dr. Watt, took in considerable quantities of phosphate of lime with her food, and otherwise, during the entire period of utero-gestation, which resulted in giving to that mother two charming boys, each weighing at birth over thirteen pounds, who grew in stature and comeliness, and developed at twelve or thirteen years, said the doctor, the finest sets of teeth he had ever seen. This mother had other children afterward, but neglecting the phosphates, they resembled their sister in the particulars above named. This, to be sure, was a single instance, but it is a fact of great significance in proof of the doctrine just advanced, and which I regard as fundamental of all others in securing that renovated condition of the teeth of our countrymen, which it is the province and in the power of our profession to accomplish. We have other duties and powers, gentlemen, than simply to repair the ravages of decay, and to supply the losses occasioned by this dental atrophy to which allusion has been made. To us belong the duties, and we have the facilities increasing every day, of giving to the vast millions who are now living, and are yet to live in this country, and the world, the greatest of physical blessings—a sound and durable set of natural teeth.

We have already given to surgery and the world the most reliable solace in the hour of fiercest physical agony which all scientific history furnishes—the practical application of all anæsthetics to prevent pain, the credit of which belongs of right to the late Dr. Horace Wells, a dentist of Hartford. I discern before me an honest and earnest phalanx of live men who are bound to push their inquiries and labors in the right direction toward an honorable and lawful distinction in our eminently proper and laudable calling! the stimulus of whose zeal is not so much to pocket a few dollars by a temporizing policy, ending with each day, but a manly forecast toward a beneficent and brilliant future which will do ample justice to the best endeavors of the best of men. But to accomplish anything in this direction, it is incumbent that the dentist be thoroughly competent to advise, and in other respects worthy of confidence in the most delicate sanctities of the nursery. He must not only be a careful physiologist, but he must possess a pure and exalted philanthropy, ready to impart the knowledge he may possess, without fee or reward, to persons wholly unknown. His motives must be pure and unselfish. He must be gentle in manner, devoid of all insincerity, having a clean conscience, zealous, of noble and philanthropic works, which are performed with a single eye to the generations who are to come after him. This is just the hinge on which all our hopes of the future of dentistry turn, and which I have endeavored to keep prominent in this discourse as the object of my humble efforts at this time.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from p. 236.)

FIRST, let us dissect a tooth—for the parts of a tooth are the parts of such tumors. A tooth is made up of enamel, dentine, cementum, pulp substance, and peridontium.

Enamel of the Teeth.—Cortex strata, adamantina dentium; crusta dentium adamantina; substantia vitrea.

The enamel of a tooth is that portion which caps the crown. In structure, it is fibrous; its fibres radiating from the centre to the surface.

In microscopic structures, the enamel (Owen) consists of long and slender, solid, prismatic, for the most part hexagonal, fibres of phosphate, carbonate, and fluoate of lime; which are essentially the contents of extremely delicate membranous tubes.

Dentine.—Os dentis, substantia ossea ebur dentis. This is the portion of the tooth between the cementum and enamel and between the pulp and the enamel. It makes up the great body of the organ. Dentine is composed of numberless tubules, these being not larger than the one ten-thousandth of an inch in diameter; their course is waving, each tubule having several curves resembling, according to Retzius, the Greek letter ϑ . "Prof. Retzius confirms the observation of Müller, that the tubes contain an organic earthy matter in granular masses, which disappear under the action of dilute muriatic acid. The cells, and the small tubes which radiate from them, also contain earthy matter, as in bone. They are naturally white and opaque; but, after maceration in dilute muriatic acid, become colorless and transparent."

Chemically, dentine differs from enamel principally in the absence of the fluoate of lime.

Cementum—Crusta Petrosa.—The cementum of a tooth is that portion which invests the fangs. In character, it corresponds quite closely to the osseous structures. The microscope demonstrates clearly the existence of Haversian canals, and the so-called corpuscle of Purkinje, or, as Robin prefers to term them, osteoplasts.

"In growing teeth, with fangs not fully formed, the cement is so thin that the Purkinjian cells are not visible; it looks like a fine membrane, and has been described as the periosteum of the fangs, but it increases in thickness with the age of the tooth, and is the seat and origin of what are called exostoses of the fangs, which are wholly composed of it." "It is the presence of this osseous substance," says Professor Owen, "which renders possible many well-known experiments of which the human teeth have been the subject; such as their transplantation, and

adhesion into the combs of cocks, and the establishment of a vascular connection between the tooth and the comb," etc. Under every modification, the cement is most highly organized, and most vascular of the dental tissues, and its chief use is to form the band of vital union between the denser constituents of the tooth, and the bone in which the tooth is implanted.

Dental Pulp.—The pulp is that vascular, reddish-gray, highly-sensitive substance, occupying the cavity of the tooth. It is made up of delicate connective tissue, in which ramify the dental nerve, artery, and vein.

"When," says Mr. Nasmyth, "the internal structures of a dental pulp are examined, the number of minute cells which present themselves in a vascular form is remarkable; they seem, indeed, to constitute the principal portion of its bulk." Mr. N. describes them as "varying in size, from the smallest microscopic appearance to one-eighth of an inch in diameter; and as being disposed in different layers throughout the body of the pulp." This tissue is highly endowed, and, perhaps, more liable than any portion of the body to take on morbid action; fungoid degeneration is, perhaps, its second and most common disease.

Periodontal Membrane.—This is the periosteum of the tooth. Anatomically and physiologically it differs little from this general class of membranes. Pathologically, I think it may be remarked as being more susceptible to disease, and more disposed to assume quickly the acute conditions. For example, inflammation of the periodontal membrane is easily provoked, and, once inflamed, it is ever after surprisingly prone to reassume morbid action. Again, we need only call to mind its epulic outgrowths; the frequency and varied character of these growths.

Familiar with tooth structure, we turn to Fig. 4, as referred to, and trace a perversion of development in all these structures; see them forming a tumor, strictly dental, yet, to the last degree, anomalous and abnormal.

Microscopic Examination of Tumor, made by Prof. Ch. Robin.—Fig. 4 (400 diameters).—This figure represents a portion of a slight cut made into the tumor represented (Fig. 3, *a*).

The preparation is taken from near the free edge, or the irregularly mammillated surface of the tumor. The latter is formed principally of the ivory or dentine, easily recognized upon the thin section by its very fine tubes, disposed in parallels, or nearly so, through part of their extent (Fig. 4, *e*).

These tubes, radiating more or less regularly from the little depressions or cavities observable in the mass of the tumor (Fig. 3, *a*), very near to each other through part of their extent, these tubes of ivory become more rare, fine, and ramified as they approach the surfaces of the dental tumor (Fig. 4, *d, f*), and end in a very sharp point toward the lines of junction between the ivory and the enamel (*a, b, c*), and the cement

(*f, g, h*). The presence of the ivory, which forms the greater part of the tumor, demonstrates its dental nature very clearly.

Enamel.—Another important particular is the presence of the enamel on the surface of the tumor, where it, in some measure, covers the irregularities with a varnish which moulds itself upon them in order to penetrate more or less deeply into the fissures or depressions that divide the tumor superficially into lobes.

This bed of enamel varies in thickness from microscopic dimensions to a millimeter ($\cdot 03937$ inch), or near it, and is as irregular in places on the lower or adhering face as it is on the free surface, which the microscope alone allows to be seen. The portion of the section of the tumor that is here delineated (Fig. 4) is taken at the level of one of the points where the enamel (*a, b*) in a manner penetrates (*c*) into the body of the ivory mass of which the tumor is principally formed.

The enamel is easily recognized by its narrow prisms, from six to eight-thousandth of a millimeter in width, which are in immediate juxtaposition (Fig. 4, *a, b*). The figure shows them inclined, as by the accidents of the cuts in making the section. When the cut is perpendicular, or nearly so, to their greatest axis, their prismatic form, with five or six faces, is easily seen; this is shown in the neighborhood of *b*, Fig. 4.

Cement.—In the depth of the fissures, and here and there in the mass of the tumor, near its surface, and especially that part of the surface hidden in the adventitious cavity of the maxillary bone, the microscope discovers some trails or beds of variable thinness, formed entirely of the substance of the cement (Fig. 4, *g*).

The cement is inclosed between masses of ivory, and is consolidated by the immediate contact (Fig. 4) with the masses between which it lies. It extends itself in places with the surface of the tumor to the neighborhood, and even to contact with the enamel. The section represented in the plate is taken at a point that shows this arrangement (Fig. 4, *f, g, h*). There are, besides, thin pieces of cement extending far forward into the body of the tumor.

The cement is known to be no other than the osseous substance. The figure before us exhibits the characteristic elements belonging to it. These are the microscopic cavities, called osteoplasts, or, incorrectly, osseous corpuscles, for they are excavations. The air that fills the dry bone makes these cavities appear black under the microscope (Fig. 4, *g*); but, in the fresh state, they are full of liquid, and are pale and more difficult to observe than in the dry pieces.

These cavities, which are, in breadth and length, from one to three-hundredths of a millimeter, are always of very irregular shape, on account of the presence of the fine tubes that start from all their peripheries, and traverse even the substance interposed between the osteoplasts.

The best joined pieces show that these little canals are subdivided two or three times, and are then inosculated with those of neighboring osteoplasts. The portion of cement, shown in the plate, does not exhibit this arrangement, which was visible, nevertheless, in the parts close to it.

The cuts in the tumor exhibit, moreover, little openings that are either full or empty, of a grayish or brown pus. These small orifices are from two to six-tenths millimeter and upwards in width, and from about one to two millimeters apart. The microscope shows that these orifices accompany the narrow, irregular cavities, sometimes in the form of elongated conduits hollowed out of the ivory which they pass through. The instrument also shows that the tubes of the latter start from these cavities to radiate toward the surface of the tumor, in the same manner as the tubes of the ivory in the normal tooth start from the natural cavity of the dental pulp. These narrow, irregular cavities, more or less elongated, traverse the mass of the tumor, and some of them even reach within a few millimeters of the surface.

These cavities are, in reality, nothing more than the pulp cavities of this morbid product, either rugous from desiccation or still containing some remnant of the dried pulp in the form of a brownish or grayish powder.

Recapitulation.—The result of all these observations of the case is thus epitomized by M. Forget.

1st. An original union of the follicles of the last two molars followed by an intimate union of them, caused by phlegmasial or other actions.

2d. Under the same morbid influence, the excess of vitality in the organic elements of the follicles has produced hypersecretion of an ivory-like osseous substance.

3d. That the irregular aggregatism and diffusion of these constitutes the pathological growth.

4th and lastly. Its growth has formed in the cyst, and it has maintained therein a permanent inflammation which has disorganized the osseous tissue and altered the structure of the adjacent soft parts to such an extent that a radical operation was necessary.

Thus we have the extremes: a simple cyst, with a tooth in it, and a tumor so complex in character and structure that no one but the microscopist might hope to be able to recognize it. Yet these tumors, differing so widely in their features, are alike in the most important one of being benign. Their prophylaxis is the same, and for a good distance their surgery runs side by side.

Dental tumors, intermediate to these two classes, are of various features. But, with an ability to recognize the dental elements—with an understanding of the minute histology of enamel, dentine, cementum, and pulp substance—what difference can it make, having eyes and a microscope, how these elements aggregate?

I once saw a tumor taken from the maxilla, which looked like a mass of ivory; it was quite as large as two of the molar teeth put together. I need scarcely say that it was two of the molars; their germ had in some way affiliated, and, remaining encysted, had produced this abortion. The microscope revealed very distinctly the tubulated character of the mass; this pronounced it dental quite as satisfactorily as though the shapeless lump had been moulded to the tooth-form.

I have had shown me, as great curiosities, teeth with ivory masses projecting at right angles from their crowns. But I never have seen this anomaly where it was not plainly evident that the projection was a twin tooth—the result of germ-union;—there would be a tooth missing in the arch.

Many curious illustrative instances could be mentioned of anomalous incongruities in dental evolution; but, as we are prepared to understand, we would find them in character the same—enamel, dentine, cementum, and pulp structure. The arrangement only would be found to differ; with our eyes, or assisted by the microscope, we could or should be able to say of any of them, This, and this, and this is dental.

The ability, then, to distinguish a dental from a malignant osteoid tumor must certainly prove a source of much satisfaction; for, as M. Forget curtly remarks, “If intervention cannot be too radical in an instance of cancer, it is certain, on the contrary, that more caution and moderation are necessary when it is a question of a lesion, which is essentially local and of a benignant nature, and allows the surgical operation to be restricted to the precise limits of the lesion, without its being necessary to provide against an improbable repetition by encroaching upon the osseous tissues that border on it, and thus subjecting the patient to a mutilation, which could not be justified.

Data.—1. There are twenty teeth in the deciduous denture, which twenty are to be replaced by thirty-two, each of which is to be at least twice the size of its predecessor.

2. A contracted maxilla, having no accommodation for certain teeth, the germs of which are in the jaw, gives us, among other lesions, irregularity in dental evolution.

3. Irregularity in evolution yields morbid conditions, as described, and which conditions are influenced, not unlikely, by peculiarities of the general organization and manner of interference with development.

4. An overcrowded arch will surely yield periodontal and other minor troubles, and may produce lesions of grave character. The extraction of certain of the bicuspidate teeth of the permanent set should, therefore, be practiced, whenever time shall make evident the existence of contractions on the part of the arch.

5. Dental tumors vary from simple cystic growth to such perverse and anomalous evolutions, that the microscope only is capable of explaining them.

6. A dental tumor is any abnormal growth of the mouth having its point of departure and development in irregularity of dental evolution.

7. Dental tumors are benign; operations for their cure promise all success, and may be practiced in exclusive consideration of the disease as it locally exists.

8. The existence of a dental tumor is to be inferred, "*cæteris paribus*," when there is deficiency and derangement in the dental arch.

(To be continued.)

THE USE OF SPONGE GOLD.

BY GEO. A. MILLS, BROOKLYN, N. Y.

My experience with sponge gold since February last, teaches me that much can be said in favor of its almost exclusive use, by good operators, where gold is to be used at all. Much can be said in favor of several other materials used for filling teeth when in the hands of thorough and competent dentists. Tin foil, amalgam, Wood's metal, Hill's and Bevins' stoppings, etc. etc., have all, I think, a mission to fulfill. But I will not attempt at this time to defend their use, leaving the subject to some future time.

The value of sponge gold was urged upon me by my friend Wm. H. Allen, of New York, in the month of February last. I had used it occasionally in 1854, '55, and '56, in connection with foil, for the purpose of making a better finished surface to the filling, and in some cases quite to my satisfaction at that time; but my practice then being in a small country town, I thought I did not find sufficient encouragement to "prove all things and hold fast to that which was good;" which I now believe was an entirely false notion, yet a great many make the same error at the present day, and will not see it until brought under the elevating influences of a proper dental education.

I commenced using sponge gold with the same serrated pluggers as I had been accustomed to use for foil; but found trouble with the honey-combed condition of the filling spoken of by Professor McQuillen, in the November number of the DENTAL COSMOS, and it soon became evident that they could not be successfully used with sponge gold. I ordered some made with shorter and finer serrations, which obviated all that difficulty. The serrations on the points patterned by Dr. Arthur some years ago—file cut—make a most excellent surface for condensing the last layers of sponge, removing all the deep indentations that may be present, and presenting what would seem to the eye a perfectly finished surface after a little use of burnishers, etc.

Excellently made instruments have a great deal more to do with the success of good operations than many are aware of; but I was told by one of our most accomplished instrument makers, a few days since, that

a great change had taken place in the last three years. He says the dentists are far more particular, and seem to know better what they want, and when they have it. One difficulty I feared in the use of sponge gold was making good edges, especially when they were thin. I was told to protect such by using layers of foil—I did so for a time, but soon found that it was not necessary with proper-shaped instruments. I can make better finished edges and with a greater degree of solidity than I have ever before made. I have tested it on a great variety of cases, and I find such uniform success in this direction that I am inclined to cry out "Eureka!" I desire to be eclectic in all things, yet I find myself from day to day making an almost exclusive use of it when gold is to be used, having consumed not quite two-eighths of foil since February last. I have tested it in large and small cavities, from the smallest to those requiring one-eighth and a sixteenth. There is one danger in the use of this preparation of gold that some may fall into—packing it in too large quantities at a time. In small cavities it is well not to take a very large piece at once, for fear of blinding the operation by its obstruction. In large cavities greater dispatch can be made with the use of long pieces, by taking the piece it is desired to apply carefully by the edge with the plugger, and carrying it to the location needed, then feeding with the plugger, between the blows of the mallet from side to side of the mass, making a rapid disposal of it, and leaving it in a very solid condition. In this manner a quick disposal can be made of an eighth, in a cavity easy of access. I do not think it necessary to use the two blows that many do with the mallet, but a succession of blows with uniformity, thus shortening the operation, much to the benefit of the patient and operator.

I have heard objections made from time to time in the past, to the uses of sponge gold, because it required such a great amount of time to manipulate it, as it needs to be used in such small pieces unless the operator is possessed of a superior amount of physical force; in which it is well known a majority of the profession are deficient; therefore I believe it to be a great saving of strength and time to use the mallet for the purpose of condensing the gold in a great majority of cases. I trust these few words may induce those who have used sponge gold before, without success, to give it a new trial, and others who have never made the trial, to do so.

PHYSIOLOGY AMONG DENTISTS.

BY GEO. WATT.

ACCORDING to its derivation, physiology includes in its teachings the functions and properties of all natural objects. As at present used, however, its meaning is much more restricted. We speak of physiology as the science which teaches the functions of the various organs of animals and vegetables in their normal or healthy condition.

When there is a departure from the normal state, the degree of departure, its nature, cause, and remedy, form a basis for another science, commonly called *pathology*. As this term is generally used, one might properly define pathology to be the *physiology of disease*. A knowledge of pathology presupposes a familiar acquaintance with physiology. For, if the mind is not familiar with the healthy condition, how is it to recognize departures from it? And an acquaintance with either, or both of these, implies the previous study of anatomy; for the organs themselves must be known before much can be known of their functions. Anatomy is pertinently called the basis or foundation of medical science. With the same propriety, physiology may be regarded as the second stratum.

If physiology be strictly confined to a consideration of healthy functions, we are not likely to find such a thing as *human* physiology. Man is a fallen being. During all the generations of his existence, he has violated the laws of his physical being—the laws of health. As a consequence, no perfectly healthy human constitution can be found. Hence, if the rigid definition be adhered to, human physiology is nothing short of pathology. But this rigidity of definition is found to be inconvenient in practice, and it is common to speak of the *physiological* condition of organs which perform their functions in accordance with the ordinary state of human health. This indefiniteness has its inconveniences, for it is impossible to tell the exact point where physiology ends and pathology begins. But all generous minds will submit to the inconvenience rather than be obliged, under all circumstances, to regard man as diseased.

If, then, all departures from the healthy state are but changes from a physiological to a pathological condition, it follows that the two sciences which take cognizance of these conditions and changes, are practically the most important to the medical man, whether he be a general practitioner or a specialist. Can anything be more absurd than for a man to prescribe for a morbid condition which he does not comprehend? Can anything be more ridiculous than a man's labors to restore an organ to health while he is ignorant of what is the normal function of the organ? Yet, absurd and ridiculous as they are, such efforts are far too common. My opportunities for observing the practice, both of physicians and dentists, have been quite extensive, and I am convinced that a great majority of their failures and shortcomings result from the want of clear views in physiology and pathology.

The neglect of physiology by the profession seems to be intentional. In the college curriculum it is usually placed as a caudal appendage to a chair already overcharged. John Jones, "Professor of Anatomy and Physiology," ordinarily implies that, so far as the consideration of the latter by the said Jones is concerned, it is profession only. My observation, extending to a number of colleges, gives me the impression that from a chair of anatomy and physiology, all the attention, or nearly all that the latter

receives, is an occasional remark, parenthetically introduced, during the lectures on anatomy. In our dental schools the chairs expected (?) to impart physiological instruction are variously styled "Dental Science and Mechanism and Physiology," "Anatomy and Physiology," "Anatomy, Physiology, and Hygiene." Now, from such an arrangement, no sensible man would expect the science of physiology to receive the attention to which its great importance entitles it.

But this apparently studied neglect of physiology by our profession may raise the inquiry with the young dentist, and especially with the dental student, whether, after all, the science is really so important. Let us consider this.

To argue that those who operate on living organs should be familiar with the laws governing the life principle of these organs, ought to be regarded as supererogatory. But being well convinced that but few in our profession appreciate the importance of a knowledge of physiological principles, I incline to offer a few illustrations:

When the attention of a dentist is called to a pale, delicate babe, suffering the ordinary agonies of first dentition, unless he is familiar with the physiology of the nervous system and of the mucous membranes, unless he is able, with a good degree of accuracy, to estimate the life power of the little sufferer, his diagnosis, treatment, and prognosis are but guess work. Unless he can read the symptoms and manifestations of the case as he would read a book, he has no right to prescribe or operate, and if he does so, he is guilty of an outrage on an immortal soul.

Or, if the patient is a delicate lady, anticipating maternity, what an outrage for a man, ignorant of the laws of life, to trifle with the destinies of two immortals!

And even if the patient be a God-forsaken, man-despised, loathsome, rotten, syphilitic carcass, he has a right to expect that the man who assumes to be a member of our profession has made such scientific attainments as will enable him to form a correct diagnosis of the case, and to adapt appropriate treatment, if the case be still amenable to treatment. In this, and in all the cases referred to, unless the mind has a clear conception of the normal state of the organs involved, the nature and extent of the departures from it cannot be understood. But it is unnecessary to specify further. In every diseased condition that can arise, the man competent to take charge of it is he, and he alone, who is familiar with the organs involved, and their functions in health and disease.

Reference has been made already to the ordinary position of physiology in the *curricula* of our colleges. The question naturally arises, whether or not this apparently studied neglect of the science shows its legitimate results on the profession? Let facts bear witness.

In former days, when each member of the profession was to a great extent isolated, this question could not be settled by observation. But

now, when association and a free exchange of ideas prevail, and especially when we have a great delegated body, representing the earnest, progressive portion of the profession, its solution is easy.

I am well aware that many first-class dentists have never been delegates to or members of the American Dental Association, but I feel that I am warranted in claiming that in its membership are as good dentists, and a greater proportion of good dentists, than can be gotten together by any other process. It may be profitable, then, to notice the state of physiological science in this society.

It is not proposed in this connection to say anything about the report of the Committee on Dental Physiology. That is a fair representation of the attainments of the committee, or at least of its chairman. The discussions on the subject of this report afford the best index of the physiological standing of the profession at large. But it is not intended to notice these at length, or in order. Let it suffice to notice a fact or two, occurring in connection with the late meeting in Chicago.

At that meeting was a member whose constitution had been shattered by a great proportion of the acute diseases to which a man is ordinarily liable, as, for example, fifteen attacks of pleurisy, nine of pneumonia, more than twenty each of cholera morbus, intermittent and remittent fever, twelve of dysentery, three of bilious colic, to say nothing of cholera, inflammation of the brain, erysipelas, and dozens of other diseases too tedious to mention. At the time of the meeting, this member had been suffering with articular and muscular rheumatism, accompanied with cold, clammy night-sweats for more than a year, and was then laboring under an attack of fever which had prostrated him a part of each day for a week previous. His pulse was over ninety and his respirations over thirty to the minute, during every day of the meeting. The fever under which he was laboring then confined him to bed, with sufferings beyond the descriptive powers of the most vivid imagination, for eight weeks, leaving him helpless from *paraplegia*. And yet, by professors, editors, prominent writers, and debaters, was this member congratulated on his restoration to complete health, was referred to in more than one speech as a specimen of perfect health! Because he lacked, and always had lacked, breath to burn out the excess of carbon from his system, and hence was corpulent, and because his cheeks were reddened with fever, his was uniformly spoken of as a perfect constitution, though there was not a drop of healthy blood in him. A genuine physiologist, seeing but one of his eyes through an auger hole, would have recognized that pathology and not physiology had cognizance of the case.

Let another fact in this connection suffice: while drawing illustrations from comparative physiology, a prominent and talented member told us of queen bees being reared from the larvæ of drones, simply by a change

of diet; and, though it would be as reasonable to tell of a young mountain bull, with his enormous development of head and horns, turning to a beautiful Durham cow from the effects of a red clover diet, yet no one corrected him. A physiologist can appreciate the fact that an improved diet may develop genital organs that would lie dormant under a less generous regimen, but that the *sex* can be changed by a variation of food is new to him.

Those who recognize and appreciate the above and similar facts I think will agree with me that, as a profession, we have, to a considerable extent, neglected and ignored the science of physiology. This can be accounted for in several ways. Dentists are a part of the public, and the public mind is, as yet, far from educated as to the wants and requirements of the profession, and hence the dental student starts wrong. Most persons regard the mounting of artificial teeth on a gold plate as the highest attainment of dental skill. But once or twice in my life have I heard a young man recommended as a suitable candidate for the dental profession on any other principle than that he was a mechanical genius. It is not stated by his friends who introduce him that he has a good mind, a good education, and is studious; but that he is "a great hand for tools, is always tinkering, will make an excellent mechanic," etc.

The student begins his course with similar ideas, and is impatient of every hour spent in study instead of manipulation. Such are the ideas of students, and when pupilage has ended, and professional life has taken its place, it is found that only an enlightened and progressive few have got beyond such notions. And while a great majority enter the profession in this way and with these views, it is not remarkable that there is a failure to make due provision for this study, either in the office instruction or the college course.

There is no such thing as standing still in professional science. The man who tries to remain stationary goes backward. And the same is true of the man who neglects to cultivate any science, special or collateral, pertaining to his profession. But the young practitioner is tempted to neglect the sciences on which his profession is founded, when he finds them so little appreciated by his patrons. When, by his knowledge of physiology, pathology, and therapeutics, he is able to restore a diseased mouth to health; when, by skillful treatment, a set of teeth, loose, and ready to drop out, are rendered firm and healthy, and, for charging a reasonable fee for his services he is regarded as a swindler, while his neighbor, who mutilates the mouth and removes the teeth and substitutes an artificial monstrosity, is regarded as a man of the most wonderful science and skill, and is cheerfully and liberally paid, it is not surprising that he learns to think more about manipulations than science.

It would be easy to assign other reasons for the neglect of physiologi-

cal science by our profession, but there is danger that this article will become too long.

If such is the neglect, and such are the reasons for it, the *methodus medendi* ought to be easy. The way to reform is, simply, to forsake sin. But in regard to the matter under consideration, it is quite probable that many, a majority perhaps, are unconscious of their sin, and therefore they are not to be blamed too severely, as, like Paul with his persecutions, they do it "ignorantly, in unbelief." But on those who are already enlightened, a great duty devolves—a duty no less than the illumination of the rest of the profession. "Let your light so shine before men that they, seeing your good works, may glorify your Father who is in heaven," by doing similar good works, making our profession an unmingled blessing to our fellow-men. The candles must not be put under bushels, but on candlesticks. Those already alive to the importance of this subject must endeavor to render it prominent in all prominent places—in the office pupilage, in the journals, in the college course, and, more important than all, perhaps, popular information must be disseminated, till no community will support, or even tolerate, a dentist who is ignorant of this, and kindred fundamental sciences.

It will be necessary for some to get too much in earnest (?) in order to bring others to the proper position. This is in accordance with the true philosophy of reform. A crooked stick is more readily straightened by forcing it beyond a right line. People are led more readily than they are driven, and the leader must go beyond the goal in order to bring his followers up to it.

With reference to the college curriculum, it would be easy to give physiology a more prominent place than it occupies at present. I once listened to a course of lectures, the chair being entitled "General Pathology and Therapeutics." The professor regarded it as impracticable to lecture with profit on pathology without a preliminary course on physiology. As the professor of "Anatomy and Physiology" was still cogitating among the dry bones, he gave us a short course on physiology himself. And, that the lectures were good, it is proof sufficient to state that they were delivered by the lamented J. B. Smith. Never did I hear lectures before or since with so much profit, and, from that day to this, I have felt that any college course which does not include a chair of *physiology and pathology* is defective.

But the signs are favorable. I never before saw so much earnestness in our profession on the subject of physiology as at the Chicago meeting. Though the discussions were somewhat wild, yet their earnestness promises good results. And if these remarks give additional impulse to the good cause, the object is gained for which they are written.

DR. NORMAN W. KINGSLEY'S ARTIFICIAL PALATE.

BY S. B. PALMER, SYRACUSE.

IT afforded me much gratification and pleasure in being permitted to attend a meeting of the New York and Brooklyn Dental Societies, held in New York on the evening of September 27th.

The paper read by Dr. N. W. Kingsley on congenital cleft palate, and the discussions which followed, had for me unusual interest.

Three important questions relating to that subject most prominent in my mind, were there clearly answered, viz.: Is the artificial velum all that was first claimed for it? Can it be rendered so simple of construction as to be produced by those of the profession who may choose to undertake a case? And is the method of manipulation free and open to the profession?

When the subject of Congenital Fissure and the treatment was presented to the American Dental Convention, at Saratoga, by Dr. Kingsley, I was present, also at an evening session held at the Clarendon Hotel. From that time until the present I have given the subject much thought, and felt a deep interest in the success of the undertaking, not knowing that I might ever have an opportunity to apply the principles in a single case; yet feeling that knowledge "might be very handy to have in the house."

During the past summer I have had a case under treatment with flattering prospects of success.

From remembrance of instructions received at Saratoga and the cuts published in the DENTAL COSMOS, I succeeded in producing a like instrument, though not as delicate as could be desired, and when about to repeat the operation with a view to correct apparent difficulties and to simplify the construction, to meet the demands of the case, I was permitted to attend that meeting where I received instructions full and free.

While the principle and action of the instrument have not been changed from the first, much has been done to simplify its construction and render it more durable.

It would seem that the same ingenuity and skill had been brought to bear upon those two points that was exercised in inventing the original, so that I found all improvement suggested by the perplexity in constructing the one alluded to, more than anticipated.

While I regard the construction of an artificial velum much more difficult than that of artificial teeth, there will be those in the profession competent and willing to undertake the treatment of such cases as may be presented.

The subject before the meeting being lengthy, was expected to occupy two evenings. This arrangement was much more convenient for those in the vicinity than for those from a distance; yet I was not allowed to ex-

perience any loss on that account, as Dr. Kingsley anticipated my desires and kindly invited me to his office the following day. I accepted, and had an opportunity not only to see all the models and instruments pertaining to the treatment of fissured palates, but to witness the results of skill and labor bestowed on gold in restoring decayed teeth, and building artificial crowns upon natural fangs in the mouth of his patients. The fillings I saw were fine specimens to copy after.

When Dr. Kingsley presented his treatment for cleft palate to the profession, it was given freely. I was proud of the professional attainment in common with perhaps all present, but in my late interview circumstances had changed my interest from a general to a pecuniary one, yet I found no change in the willingness on Dr. Kingsley's part to impart instruction.

However simple the instrument may be rendered of construction, or general in application, the profession and those aided by its introduction must ever feel grateful to Dr. Kingsley for the generous labor bestowed in bringing so important a subject before the world.

ARTIFICIAL CROWNS.

BY C. E. LATIMER, D.D.S.

HAVING had several cases of grafting artificial crowns upon natural roots, of late, which have succeeded to my entire satisfaction, and which are different from the usual methods of procedure, so far as I am acquainted, I desire to call the attention of the profession to the plan.

I claim nothing new in the matter, for I doubt not many have employed the same means, but if I can save some professional brother the trouble of trying experiments to determine a good method of reaching this same result, I shall be gratified. After treating the root, if diseased, in the usual way, until all probability of a recurrence of the disease shall have been removed, the foramen should be closed and the end of the root compactly filled with gold. The further preparation may be made in the same manner as for an ordinary pivot tooth; then, with a screw tap, the canal may be prepared for a piece of silver wire, with a screw cut upon it, firmly fastened into the root, and projecting a little way from the surface. Around this, and over the end of the root, Wood's alloy should be carefully worked; then an ordinary tooth for rubber, ground to fit, may be held in place with the fingers, and the metal moulded well around the rivets, and nicely finished off to imitate the shape of the natural crown.

This will hold it very firmly, and make a neat operation if properly done. I have sometimes employed an ordinary wood screw of the smallest size, cutting off the length needed from the point, and cutting a place with a fine saw for the screw-driver. The root may be prepared for the screw by the use of a bur a trifle smaller.

Where the root is badly decayed, making a funnel-shaped cavity after cleaning out the decay, shoulders should be cut in the canal, with a flat bur pressed against the sides, then the alloy well plastered upon the walls, and built down for the reception of the crown, as before, except that the screw is dispensed with. By this means roots that have heretofore been considered totally worthless, may be made to do good service for some time.

Parts of crowns may be attached, very readily, where anchorage can be obtained by small screws, or grooves, and where the crowns can be so ground as to retain the rivets. I look forward to the time when our enterprising manufacturers of artificial teeth shall find a sufficient demand for fractional crowns to warrant them in preparing them for the market, with rivets suitable for such work.

I have just treated a bicuspid where the buccal half of the crown was gone, by grafting on a small canine, ground to fit. This saved the tedious and expensive operation of building up with gold, and was far more satisfactory to all concerned.

If the root requires treatment, so as to need more than one sitting, time may be economized by allowing the patient to bite through a ball of softened wax of the size of a hickory-nut, from which a cast may be taken with a spoonful of plaster, and the tooth ground to fit, so as to be ready at the next appointment.

Many operators object to the heat necessary to soften the alloy, and I should be rejoiced if this objection could be entirely removed, but I think it principally troublesome to those inexperienced in the use of the article.

By practice an operator becomes expert in its manipulation, and can work it at a much lower temperature than at first; then by shaving a polishing stick down into a thin wedge with which to gently press the gum away, and protect it, the metal may be built over the edges of a root without difficulty.

The parts should be accustomed to the warmed instrument gradually.

The tincture of aconite applied to the gum on a small pellet of cotton will so obtund the sensibility that there will be no trouble on that score.

ON "CARBOLIC ACID."

BY W. H. WAITE, D.D.S., LIVERPOOL, ENGLAND.

IN the recently published volume of the "Transactions of the Odontological Society of Great Britain," there appears a paper by Mr. Woodhouse, of London, "On the Use of Carbolic Acid," and lest it should not otherwise fall under your notice, I beg to cull the salient points of that paper for the perusal of your readers.

It would appear that A. H. Church, Esq., Professor of Chemistry at the Agricultural College, Cirencester, Gloucestershire, first suggested the use of carbolic acid to Mr. Gibbons, dentist, of London. The paper commences therefore with Mr. Church's remarks :

"Carbolic acid or phenole was discovered by Runge, in 1834, and has since been the subject of many chemical researches. It occurs in considerable quantity in coal tar, and is extracted from that part of the heavy coal-tar oils which distills over between 150° and 200° centigrade. It was first of all manufactured by Dr. E. Sell, of Offenbach, on the Main, who twenty years ago produced crystallized phenole in large quantities.

"The true creosote differs greatly from pure phenole, although much so-called creosote is nothing but impure phenole mixed with considerable proportions of two other liquids of similar constitution, known to chemists as creosole and phosole. Chemically considered, phenole is an alcohol rather than an acid. Like an acid, however, it is capable of combining with bases to form salts; these salts are for the most part soluble in water. Advantage is taken from this circumstance, in order to separate phenole from the neutral and basic oils which accompany it in the heavy coal-tar naphtha.

"From the alkaline solution thus obtained, the phenole separates on the addition of an acid, as an oily liquid, which may be purified by distillation.

"When perfectly pure and free from water, phenole is a colorless crystallized solid, which melts at 37° centigrade, and enters into ebullition at 187° centigrade. The density of the crystals is about 1.065, that of the liquids rather less. An aqueous solution containing about 4 per cent. of phenole is obtained by adding one part by weight of phenole to twenty-four parts of water. The taste of this aqueous solution is at first pungent, then sweet. Treatment of impure phenole with water is a good mode of purification. The odor of phenole resembles that of tar, is peculiar but not unpleasant if the phenole be pure. If crystallized phenole be moistened with water, it rapidly assumes the liquid form, settling at the bottom of the vessel as a rather thick oil. It is extremely soluble in alcohol, ether, chloroform, and benzole. Phenole coagulates albumen; it is a powerful deodorizer and disinfectant, and arrests decay in and out of the body. It has been stated that phenole is an alcohol; it is the hydrate of phenyle, common alcohol being the hydrate of ethyle.

"The chemical formulæ for phenole and its congeners are :



Phenole.



Alcohol.

Phenole . . . $\text{C}_6\text{H}_6\text{O}$ —Creosole C_7H_{80} —Phlorole $\text{C}_8\text{H}_{10}\text{O}$."

Thus says Mr. Church. "The cases where carbolic acid is most useful are those in which the pulp is exposed, and when without its aid the general practice would be to destroy it. The plan adopted is as follows: When

in preparing a tooth the pulp is found to be exposed, remove the decay so as thoroughly to expose the pulp, but if possible to avoid wounding it; then syringe the cavity, dry it with cotton-wool, having another piece ready to hand on a probe saturated with carbolic acid, which at once place in the cavity, so that it may with its full strength act on the surface of the pulp (should there be any pain, it generally passes off in a few seconds); then press it gently, so as to squeeze the carbolic acid into the pulp, place another pledget of cotton-wool over it and leave it there for ten minutes or so; this repeat until the pulp appears whitish and dry. The tooth may then at once be plugged in the following way (should it not have been aching previously). If the cavity be deep as in the grinding surface of a molar, place a small plug of cotton-wool, moistened with carbolic acid, over the pulp, and on this a thin piece of gutta-percha; dry the cavity with amadon, and at once stop with the osteo-plastic—pain may be felt but it will soon subside. . . . The advantage of osteo-plastic over metal stopping is, that it is comparatively a non-conductor. . . . On removing these plugs, after a few months, the exposed pulp will often be found thoroughly ossified, and a gold filling can be successfully made. In cases where it will be impossible for the patient to return in the course of a few months, a gold stopping may at once be put over the osteo-plastic, or amalgam may be used in the same way to protect the surface. The treatment is most successful where the pulp is quite healthy and only recently exposed, but it is also effective when the exposed surface is suppurating. In these cases great care must be used to thoroughly cauterize the nerve, and in bad cases it is sometimes safer to fill with cotton-wool only for a day or so, but it is generally preferable to fill at once. When the pulp has wasted into the cavity, it is perhaps better to destroy it with arsenious acid, as the carbolic acid can be scarcely relied upon. . . . Carbolic acid is also exceedingly useful in rendering the fresh prepared surface of the cavity of a tooth less sensitive before filling it. A tooth which is aching severely from the operation of removing the decay, with the nerve not uncovered, will be almost instantly freed from pain by placing a small plug of cotton-wool, saturated with carbolic acid, in the cavity. Not only is the patient immediately relieved from pain, from the surface being cauterized, but the tooth is much less sensitive to the alternations of temperature after stopping. . . . The dressing should not remain less than five minutes in the tooth, and if fifteen minutes it will be better. . . . Mr. Gibbons has very successfully applied carbolic acid to arrest the secretion of pus from stumps, and has afterward filled them with gold, with the best results; but I have not yet so applied it. In all the foregoing cases, carbolic acid of full strength, rendered fluid by the addition of a little eau-de-Cologne, has been used; but it is very valuable in a diluted form (one part carbolic acid, forty parts water) as an injection for sluggish abscesses, inducing healthy action." Thus much Mr. Woodhouse.

Mr. Gibbons, in his notes on carbolic acid, says: "In the treatment of sensitive dentine, exposed pulp or alveolar abscess, carbolic acid perhaps is superior to any agent known to the profession. Its action is painless, soothing, and has the peculiar property of exciting no inflammation. Several teeth may consequently be treated at the same time."

"A double layer of parchment paper, saturated with carbolic acid, and laid at the base of the cavity, is suggested as an improved method of manipulation."

I have no experience that would be at all reliable, as yet, on the action of this agent. I would, however, venture to suggest that instead of the "osteo-plastic," a good temporary filling of Hill's stopping would be preferable, on account of the danger of undue irritation from the chloride of zinc contained in "osteo-plastic." Mr. Woodhouse informs me that he prepares carbolic acid for use by gently warming the bottle containing the crystal, and when liquid, adding about 5 per cent. of Sp. Vini. Rect. which prevents any recrystallization. Care should be exercised to preserve the mucous membrane of the mouth from contact with the acid, as it produces very unpleasant effects thereon. Largely diluted, as one part in forty parts water, or better, rose-water, it forms an effective wash for sore-mouth, ulcerated gums, etc. etc.

10 OXFORD STREET, LIVERPOOL, Nov. 3d, 1865.

PROCEEDINGS OF DENTAL SOCIETIES.

DELAWARE DENTAL ASSOCIATION.

BY W. G. A. BONWILL.

THE third semi-annual meeting of the Delaware Dental Association was held in Wilmington, Wednesday, May 10th, 1865, Dr. S. Marshall in the chair.

Dr. Treadwell, of Delaware City, and Dr. Wm. T. Smith, of Salisbury, Md., were elected active members of the Association.

On ballot, the officers for ensuing year were elected as follows:

President, Dr. Marshall; *Vice-President*, Dr. Wm. T. Smith; *Corresponding and Recording Secretaries*, Dr. Bonwill; *Treasurer*, Dr. Jeffries; *Librarian*, Dr. E. Lewis; *Executive Committee*, Drs. Sanders, Shelp, and Lewis.

Essays being next in order, Dr. Bonwill read a paper upon "Filling."

He endeavors to adopt the *eclectic* or *conservative* practice in this specialty as well as the other branches of dentistry. Believes in *immediate* wedging, but not to the extent advocated by some—that of obtaining the same space in two or three hours which should take as many weeks—instead, replaces wedges at least three or four times while the patient is in

the chair, say a sitting of two hours, passing to some other cavities while the wedge is acting, never producing more than an unpleasant feeling for a few minutes after insertion. Resorts to it principally for raising the gum above the free margin of the cavity, and, at the same time, to gain a *little more space* to facilitate the passing of the thinnest file in dressing fillings. Prefers to cut away the palatine, and sometimes the labial walls to gain space, rather than forcible instantaneous wedging, or, where weeks are absorbed, to gain the same result. Most cases are so badly decayed as to require the palatine wall leveled with the floor, and the labial also. It is far preferable to cut away one or the other of these walls than to gain space by wedging, and have to fill *around a corner* or *at an angle*; filling in a direct line being most reliable. In all cases posterior to cuspids, prefers to separate with chisel, believing that a free space is much more desirable for permanent health, notwithstanding the greater liability of food to press into the space upon the gum. Considers the more familiar an operator becomes with such cases, the less space he requires for filling. Seldom uses wedges for space. Retains the point of incisors, in majority of cases, as a shoulder; but in all teeth posterior, makes the neck near the gum occasionally an exception. Has found most success in a wide division made with the chisel in bicuspids and molars. Where there are the least signs of caries in the grinding surface of any of these teeth, extends the approximal into that of the surface, making a continuous filling. Sometimes has occasion to allow the fillings to touch each other or the perfect wall of the opposite surface; leaving clear space above and below the point of contact.

When he first commenced practice, used wedges in one form or other in *almost every* case. Now it is the exception, the minutest cavities only requiring it.

If the pulp is exposed, or nearly so, destroys at once with pure arsenic and creosote, mixed at the time, and does not resort to any palliating remedies.

If careful in inserting, allowing none to be pressed out upon the gum or peridentium, has no other trouble with the case. Has an occasional exception here, as in performing any of the other operations upon the mouth. Extracts nerve after twenty-four hours, in most cases, while the apex of pulp is not much affected from arsenic; heals more satisfactorily; not so much danger of abscess; temporarily fills for three or four weeks; has extirpated pulps without any application of arsenic, and filled at once; found this practice as successful as the other; endeavors to stop all nerve canals; cannot, in most molars, except the palatine root in superior and posterior root in inferior jaw.

Where metals cannot be used, stops with cotton and creosote; or the latter alone, where the former cannot be used in conjunction. Is *scrupulously careful* that every possible particle of decomposed membrane is

removed from the canals. More depends upon this than the filling of canals. This, however, should never be neglected when possible; is troubled with *but few abscesses*.

In compacting, uses the most finely-serrated points, and Abbey's No. 5 *old-fashioned gold*, heated upon a thin sheet of metal over a spirit lamp. Uses this in commencing and finishing all cavities where there are three walls to support it. Where "building up" is to be done, runs a rope of a third of a sheet through the flame and cuts it in very small pieces; thinks best to adhere to the use of one number of foil; has had better success than from changing to suit size of cavity. The same number, with more metal in each roll, answers the same ends. Uses tin foil as next best to gold, and takes the same trouble to compact or weld as with gold. Where cavity is compound and larger, and subject to much wear, prefers Wood's metal. *Never used amalgam!*

In excavating, uses no anæsthetics or obtunders, save the keen, razor-edged hatchet excavator, with all its angles sharpened. Makes a careful reconnoissance to know exactly what must be done; in what direction to operate, that no unnecessary move may be made. Directs the patient to exhaust the lungs, and very gradually inflate them, as if drawn through a quill, at the same time making the muscles of the face and jaw as rigid as possible. Believes this practice, in the hands of *all classes of dentists*, would be attended with more success and far less injury to the organism. Let no one decry this idea until several trials have been made. Investigation will prove it to be philosophical; has never had cause for trying the mallet; prefers very *small points* and a *muscular hand*; comes as near to making *gold weld* as is possible under the various circumstances; uses burnisher as soon as done packing; considers it very essential upon approximal surfaces when but little space has been obtained.

In dressing fillings, where he cannot use Arkansas stone, has vulcanized rubber files and strips with corundum vulcanized in them or used on plain strips with soap, which is equal to stone in cutting, and not liable to break, and leaves as perfect a *mirror finish* as can be obtained, restoring the beauty and symmetry of the tooth.

Dr. Flagg, of Philadelphia, being present, was called upon, made valuable remarks upon the great work of *Dental Education*. Instanced cases to show why each and all should "be up and doing," by patronizing every means made use of by the *heads* of the profession in giving to each student the most thorough course of *Dental Tuition*—first, by being properly instructed by a private preceptor, and, as a final accomplishment, the Dental College. Be it said to his honor, no special school was advocated. "*Excelsior*" being *the aim*.

The doctor explained wherein he differed from the practice of Dr. B. in filling. Was as severe in his condemnation of those unsympathizing operators who do not use dentinal anæsthetics, as Dr. B. was on those who

do. He uses, in majority of cases, chloride of zinc, chloroform, creosote and soda, as his principal agents. Considers them positively essential to perfection in practice. In all other respects, his course of treatment was similar to that of Dr. B.'s.

Dr. Darby, of Elkton, Md., gave a summary of his practice in this specialty, which was in many respects similar to Dr. B.'s.

Dr. Marshall read a paper upon Sensitive Dentine, and its Treatment, the substance of which was the advocacy of some Dr. —'s secret remedy, believed to be cobalt, which had been attended with such grand results in his practice, that he could not withhold the facts from the profession. Could allow it to remain in cavity for days without the least present or future inconvenience.

Dr. Bonwill presented a very large sequestrum of the lower jaw, extending from the first bicuspid to the ramus, and along its inner margin, dipping down in the centre beneath the submaxillary vessels, involving their structure, and finally causing their sloughing without any very great hæmorrhage.

The extraction of the second molar tooth by an M.D., gave rise to the fracture. 'Tis needless to state that the parts granulated rapidly after removal of necrosed bone, and use of astringent applications.

Dr. B. also presented one of his articulators, which gives all the motions of the human jaw, and from the one base can be articulated any number of cases without disturbing the plaster model for each case; can lay them aside and use the same one year thereafter, or at pleasure.

Adjourned to meet in Wilmington, second Thursday in October, 1865.

CONNECTICUT VALLEY DENTAL ASSOCIATION.

BY L. D. SHEPARD, D.D.S., SALEM, MASS.

THE annual meeting was held in Springfield, Mass., October 31st. Over forty members were present.

The following were elected officers for the ensuing year:

President.—J. Beals, Greenfield, Mass.

Vice-Presidents.—J. McManus, Hartford, Conn.; O. F. Harris, Worcester, Mass.

Secretary.—L. D. Shepard, Salem, Mass.

Treasurer.—C. S. Hurlbut, Springfield, Mass.

Executive Committee.—E. E. Crofoot, Hartford, Conn.; F. C. Buckland, Manchester, Conn.; Ralph Morgan, Chicopee, Mass.

The retiring President, Dr. O. R. Post, Brattleboro, Vt., read an interesting paper. Papers were read by Drs. McManus, of Hartford, and Shepard, of Salem.

Dr. G. A. Mills, of Brooklyn, and Dr. S. P. Miller, of Worcester, were elected honorary members.

The time was devoted to the discussion of means of controlling flow of saliva; adhesive fillings; taking impressions; and to clinics, by Drs. Mills and Shepard.

A new Gas Inhaler was exhibited by the inventor, Dr. Bullock, of Cambridgeport, Mass., also some castings for Cleft Palate, with remarks thereon, by Dr. Welton, of Cheshire, Conn.

The next meeting will be held in Worcester, Mass., the first Tuesday in June, 1866.

MERRIMACK VALLEY DENTAL ASSOCIATION.

BY G. A. GERRY, LOWELL, MASS.

THE third annual meeting of the Merrimack Valley Dental Association convened at the Phoenix Block, in Concord, N. H., November 2d, 1865, at eleven o'clock. There was a fair attendance of the members.

Soon after the meeting opened, the President, Dr. Ambrose Lawrence, of Lowell, Mass., delivered the

ANNUAL ADDRESS.

Gentlemen:—We meet to-day in this proud capital of the Old Granite State to lay on the altar of our association renewed pledges of professional fealty and respect. Here, on the banks of the tranquil stream whose name we take, where, from its source to the Atlantic, the busy hum of the spindle, the clanking loom, and the sonorous anvil, have superseded the war-whoop, tomahawk, and scalping-knife, we welcome each other to the trials, duties, and pleasures incident to our annual meeting. Here we challenge free discussion, free thought, and opinion upon whatever pertains to our professional advancement, that we may render ourselves respectable and be respected—useful and be appreciated. Before proceeding to the consideration of the more important and interesting matters which will shortly claim your attention, I propose by your indulgence to present a few thoughts engendered by the circumstances connected with the formation and present status of our association. Our organization was consummated two years ago this day.

The time was inauspicious, but the perseverance of those most active in the work accomplished that which in their judgment would conduce to the prosperity of the profession, and the Merrimack Valley Dental Association stood forth as another small star in the grand constellation which lights up our professional firmament. May this, our "Star in the East," guide us to greater usefulness and continue to illumine the pathway that leads to the temple of knowledge long after we shall have passed through the portals made sweet by the skirts of our Blessed Redeemer.

We may be allowed the indulgence, in a reasonable degree of satisfaction in view of our success thus far, and of our standing in the circle of similar associate bodies throughout the country.

The AMERICAN DENTAL ASSOCIATION, lately in session at Chicago, has satisfactorily recognized us, there being no desire manifested to "leave us out in the cold." On the contrary, we were welcomed into that body of warm-hearted and intelligent men, as brothers and co-workers in an ennobling and useful profession.

I may be permitted to say, in my own behalf, that I was amply repaid for the time and expense of attendance in the pleasure of listening to those more learned and experienced than myself. I have returned with a new lease of life and a greater determination to be useful to the extent of my poor abilities, that when called hence it may not be said of me—he left no foot-prints to mark his going forth.

It is invigorating to draw in the exalted atmosphere of enlightened presence. It mollifies the soul and roots out the weeds of envious discord, heals the wounded spirit of conscious integrity, and covers with the mantle of charity the digressions and shortcomings of our fellows. Then let our national gatherings find full representation from all our local societies. Let this association, at least, not fail to send its full quota, though small.

For want of material—geographical position forbidding—we cannot reasonably anticipate a numerous membership; yet that simple fact presents no barrier to our associated or individual success; and considering the short time since our organization, we ought to be abundantly satisfied with the indorsement thus far bestowed.

The Merrimack Valley contains but thirty or forty dentists, all told, of which number fourteen were present at the organization, and became members thereof. Twelve others have since joined, and one of the original number, Dr. Vipall, has died, thus showing that we have twenty-five "good men and true" enrolled in the work of regenerating and exalting the status of our profession in the Merrimack Valley. In what other section of the country have a full majority come up so manfully to indorse and aid in an organized effort to give character to their calling?

Now, having established our association upon the sure foundation of success, shall we rest satisfied with semi-annually going through the dull forms of legislation inseparable from such bodies? No, gentlemen; let us thoroughly sub-soil the entire field of our labor and bring to light the rich treasures that lie beneath the surface wherewith to store our minds and add something to the general stock of useful information. One grand object we have in view is, that modes of practice may be investigated, compared, harmonized and improved, all in the light of sound theory.

Take, if you please, filling teeth with gold—a subject sufficiently discussed, it would seem to be well understood and successfully executed by every practitioner in the country; yet such is not the fact, for the matter is receiving more attention now than ever before.

Perhaps the most marked innovation upon the time-honored method of consolidating the gold in filling teeth is the introduction of the mallet for that purpose by Dr. William H. Atkinson, of New York. That so novel a departure from ordinary practice should meet with indifference, opposition, and ridicule from a part of the profession, and be hailed with satisfaction and delight by the rest, is not strange, it is simply human. In this matter opinions most certainly conflict, but if we act upon the saying, prove all things and hold fast that which is good, we shall arrive at pretty correct conclusions respecting the merits of the implement in question.

My own experience with the mallet, although I was at first not a little prejudiced against it, has thus far been favorable, and there is no doubt in my mind that a filling of greater density can be made with than without it, but manipulative skill is requisite, the mallet not answering as a substitute for brains.

As with the matter just referred to, so with the entire list of operations we are called upon to perform. There is a great diversity of practice, every one honestly thinking his own mode the preferable one whether attended with the best success or not. Again, if we sail over the jaundiced sea of theory and angle with our thoughts for ideas, we shall find our prizes of as many shades of value as are the finny tribes that sport beneath old ocean's tides, and in many cases will require the same treatment to render them palatable.

After the reading of the Address, a copy was requested for publication.

The association then elected the following officers for the ensuing year : President, Dr. A. Lawrence ; Vice-Presidents, D. K. Boutelle, of Manchester, and E. G. Cummings, of Concord ; Recording Secretary, G. A. Gerry, of Lowell ; Corresponding Secretary, J. H. Kidder, of Lawrence ; Treasurer, S. Lawrence, of Lowell ; Librarian, G. A. Gerry ; Executive Committee, E. G. Cummings, of Concord, S. L. Ward, of Lowell, D. T. Porter, of Lawrence, J. W. Little, of Concord, and L. F. Locke, of Nashua.

At the afternoon session, Dr. J. H. Kidder read an interesting essay entitled "Mutual Relations of Dental and Medical Practitioners." The association then entered upon the discussion of "Conservative Dentistry." Professor Atkinson opened the debate with extended remarks, and was followed by Drs. Lawrence, Salmon, Cook, Cummings, and others. The discussion proved very entertaining and instructive. It was decided to hold the next meeting in Lowell, and Hon. Moses T. Willard, of this city, was appointed essayist.

An evening session was held, at which Professor Atkinson gave an interesting lecture on "Root filling of teeth in which alveolar abscesses had existed." At the close of the meeting, the members of the association and the invited guests repaired to Dr. E. G. Cummings' rooms, where a bountiful repast and a very pleasant social reunion was enjoyed.

Second Day.

The morning session was occupied in clinical instruction, by Professor Atkinson.

In the afternoon, the following communication was received from Professor J. H. McQuillen, which was read, and a vote of thanks passed for the same, with a request that it be published.

DENTAL EDUCATION.

Mr. President and Gentlemen:—I was quite surprised to find in a printed notice, received a few days since, that I was expected to be present at the meeting of the MERRIMACK VALLEY DENTAL ASSOCIATION to be held at CONCORD, on the 2d of November, and although nothing could afford me greater pleasure than to be with you on that occasion, I regret to say that professional and collegiate duties of the most engrossing nature preclude the possibility of my leaving home at this time. Under these circumstances, I have concluded to forward to you, as a substitute for my presence, a communication on DENTAL EDUCATION. The subject is suggested to my mind by the fact that the period has again arrived for the opening of the dental colleges, and if, as has been reiterated on different occasions in our magazines, dental education is tending downward rather than upward, it becomes a matter of grave moment to the student who has at heart his own best interests and those of the profession of which he desires to become an honored member, that he should be exceedingly careful in selecting the source whence he shall derive his professional education. In other words, that he should institute a rigid personal examination of the facilities afforded by such institution or institutions as he may have the opportunity of visiting, and thus determine for himself, unbiased by prejudice and uninfluenced by the opinions of others, where he will be the most likely to obtain the greatest amount of knowledge and be the best prepared to serve his fellow-man.

The course indicated, which would be appropriate at any time, is peculiarly advisable at a period when such an assertion as that referred to above is made, and it becomes a matter of some moment to determine whether it has a foundation in fact. Not only is this a matter of vital importance to those just entering upon their studies, but to the profession generally it is also of immense moment, for anything which tends to lower the standard of education must exert a prejudicial influence upon the character and position of the profession in the estimation of the world.

As one who has long felt a deep interest in the subject, and has made it an object of careful study for years, and as a student, a practitioner, and a teacher has had a somewhat extended and varied experience, I feel that it requires no labored argument to prove the reverse of the position, *viz.*, that dental education is tending *upward* rather than *downward*, and

that, living as we are in an eminently progressive age, the march of dental science is by no means falling behind, but, on the contrary, maintains a pace equal to if not in advance of other departments of science. And in the active operations of the *past* as in the *present*, whether in the transactions of associations or as contributors to the literature of the profession, the teachers in our collegiate institutions have performed no insignificant part in aiding this progress.

Owing to the small number of students heretofore in attendance at the colleges, the influence of the faculties in this direction on dental education has been exceedingly limited, but the efforts of individual members in the magazines and in the associations have been powerful incitives to young and progressive minds to become more thoroughly acquainted with the science and art of the profession. And in this way a large class of minds have been reached who have never entered the portals of any institution.

That dental education is not yet what it should be, or what its ardent devotees hope it will be, is undoubtedly true. It is still in an infantile and immature condition, but it is gradually and steadily developing its powers and resources. Like individuals and nations, it must have its origin, growth, and maintenance, its trials and difficulties. It does not, *Minerva* like, spring into full vigor and perfection from the brain of the heathen god. Its beginning must be in the microscopic germ, and the feeble bantling needs much careful nursing, let its after-growth be what it may. Its origin is gradual, its growth tardy, often almost imperceptible, and yet, nevertheless, advancing. What it is, it has become by slow degrees, by hard labor, by the indomitable zeal, devotion, and constant self-sacrifice of men who, having its best interests at heart, willingly dismiss for the time mere mercenary considerations.

When one reflects upon the history of our country from the Colonial period down to the present time, and recalls the constant struggles for liberty and the maintenance of political existence, it is rather a matter of felicitation, that in spite of all those chilling, and apparently blighting influences, knowledge in all directions should be so generally diffused among our people, and one cannot but entertain a feeling of respect and gratitude for those wise and far-seeing men, the pilgrim fathers of New England, who, at the earliest period, and long before the savage had been tamed, the forest felled, or the fields cultivated, established seats of learning, and these begetting others, until at last our favored land rivals the old country, not only in the number but in the character and reputation of some of its institutions.

Thus is it with the dental profession; while still in its infancy and its members only numbering a few thousands, colleges have been established, not merely to meet the wants of the *present*, but also to supply the de-

mands of the *future*. What influence they shall exercise remains to be seen, but as the *present* may be justly said to foreshadow and mould the *future*, it is reasonable to infer that they will be able to sustain a fair comparison with time-honored institutions devoted to other departments of science.

As this great country advances, as it is destined to do, from a population of *thirty*, to *five hundred millions of souls*, year after year these institutions, if properly managed, will be sought after as indispensable means of education by the large number of dental students who now, as it was formerly with the medical students, receive a limited and necessarily defective instruction from preceptors in private offices.

In England, France, and Germany, the most learned and scientific nations of Europe, it has taken ages to develop and mature the general plan of instruction, and the facilities afforded by their educational institutions, and again, existing as these do under the shadow of monarchical forms of government, any innovation upon old established routine, and particularly any attempts to establish a new order of things, is not only looked upon with doubt and jealousy, but, as a general thing, most violently opposed; as a consequence of this, little or no effort has been made in the Old World, except in England, toward the founding of institutions devoted to teaching the principles and practice of dentistry, and dental students from Europe, of necessity are compelled to seek our colleges for that theoretical and practical knowledge which has given to American dentistry its world-wide and justly merited reputation.

I have said that dental education is tending upward rather than downward; the evidence in support of that conclusion is as follows: When the dental institutions first came into existence, the members of the faculties very naturally not only lacked *experience* as teachers, but many of them were in other respects poorly fitted for that responsible position. Well do I remember the feeling of distrust with which, ten years ago—after having declined in preceding years the position—I entered upon the discharge of such duties, deeply conscious of my own deficiencies, and fully recognizing those of my colleagues.

Years have rolled by since that, and with these have come—it is trusted to all (along with new schools)—experience, enlarged attainments, and increased capabilities for imparting knowledge. Again, when I recall the entire absence at that time of anything like materials for illustrating the lectures in the various departments (and which are as indispensable to the *teacher* as they are to the *student*), and contrast the ample and valuable collections now presented, one cannot but be impressed with the fact, that the opportunities and facilities for gaining knowledge are vastly improved in that direction. In addition to this, I feel satisfied that the standard of requirements for graduation on the part of all our institu-

tions is of a decidedly higher order than used to prevail; and should be exceedingly sorry to think otherwise, for it certainly was low enough at the time when a sense of duty prompted me, as an individual member of a faculty, to protest to the Board of Trustees against the laxity which existed in that particular; this, however, was in another institution than that with which I now have the honor to be connected. Like some other experiences of the past, which I have been disposed to permit to sink into oblivion, rather than bring them under the notice of my fellow-practitioners, I should have made no reference to this, but for the assertion, that of late students have been guaranteed their diplomas before matriculating, and then graduated upon two months' instruction. That such things may have been done, is possible. I sincerely believe, however, that such charges cannot justly be brought against any dental institution. It is true that practitioners who have been diligent students for years, and thus by close application to their books, have made themselves as thoroughly acquainted with the various departments of science as they were *skillful* as operators, have after an attendance upon lectures for a few months come forward as candidates for graduation and passed the ordeal with the highest honors, and in a manner which would reflect credit upon any one, let his abilities and attainments be ever so exalted; but who shall assert that by such a course as this, dental education is tending *downward* rather than *upward*? So that a man has knowledge, it matters not where he gets it, whether inside of schools or out of them. That knowledge may be acquired more readily and easily in good schools, with able and competent teachers as *aids* and *guides* to the *student*, is undeniable, but that it *can be secured* outside of them by minds possessing an indomitable will and concentration of purpose with a greater expenditure of time, patience, and money, is equally true. The influence upon education is far more salutary when such men come forward and submit to an examination on the part of a capable and reliable faculty, who shall decide upon their right to possess a diploma, than when the so-called *honorary diplomas* are distributed *ad libitum* upon gentlemen who, however worthy as men and practitioners, have neither attended lectures, submitted to an examination, nor distinguished themselves in any way as contributors to the science and art of the profession. There may have been a period when such practices were to a certain degree admissible, but that has passed away, and it may be safely said that the liberal distribution of diplomas in this way is calculated to render them as valueless in the estimation of their possessors as they are in that of the profession and the community at large.

To say that the increase of schools, by inducing competition, tends to degrade education, indicates, if not an entire ignorance of the subject, at least narrow and contracted views of it. No country in the world has

left upon the page of history a more valuable and enduring record of mental cultivation and development, and the advancement of science and art, than the Grecian Republic. Was this due to the action of a single school or the operation of numerous academies, lyceums, etc.? In our own free country, and particularly in the Northern section, is the general intelligence of the people attributable to the operation of a single institution or to the numerous universities, colleges, high-schools, and the public and private primary schools? Again, any one who is at all familiar with the literature of science is aware of the fact that to Germany, more than to any other country, we are indebted for some of the most important discoveries made in every department of science during the past half century. To such an extent is this true, indeed, that with propriety this may be almost called the Teutonic age. In substantiation of this it is only necessary to mention the names of a few among the many active German minds to whom the world of science is under lasting obligations, viz, Schwann, Schleiden, Oken, Liebig, Virchow, Kölliker, etc.

The German discoverers and writers have first been called transcendental, visionary, idealistic, and then at last when their facts and arguments have proved irresistible, they have been adopted, and too often by unprincipled plagiarists, without acknowledging the source whence their matter was obtained.

Is this truly wonderful activity on the part of the German mind, and which has completely revolutionized organology in particular, attributable to the operation of a single university or to the beneficent influence of numerous universities in various parts of that great country, affording, as they do, the most ample facilities not only to students, but also giving employment and securing opportunities to a number of professors to devote themselves to favorite departments of science, and thereby extend each year the boundaries of science in all directions?

It demands no argument to prove, that the more institutions of learning a country possesses the more extended is the diffusion of knowledge and the more enlightened and useful are its people. That which is true of general education is equally true of professional education, and although self-interest may prompt men to oppose the establishment of new institutions of learning, it is a generally recognized fact that private interest, beyond a question of doubt, must ever be held subsidiary to the general good.

In the ordinary operations of the world, men of marked ability and integrity do not complain of competition, but rather favor it than otherwise, satisfied that by such means the latent powers of all are more likely to be fully developed. They know that the unreal cannot always pass for the real; that shoddy, however complete the cheat may be, will not wear like good broadcloth; and that, although the paste brilliant may glitter

in the rays of the sun, its meretricious lustre pales before that of the genuine diamond. The same thing is true of men and institutions; they may be *overrated* or *underrated*, but sooner or later, time, which settles all things, solves such matters, and permits the truth, the whole truth, and nothing but the truth, to stand forth in the clear light of noon-day.

No better evidence can be afforded that dental education is advancing than the elevated character of the discussions in the national and local dental associations. In place of the old topics which formerly were discussed over and again until they almost became threadbare, those difficult and intricate subjects which require an intimate and extended acquaintance with science are taken up and handled in a manner which indicates a perfect familiarity with them. Not only is this true of the *theoretical*, but the *practical* is also attended to, for at the meetings of all the associations now *clinics* are held, and thus opportunities are afforded for demonstrating the manipulative abilities of operators, as the discussions test their mental capacities and attainments. Some of those who engage in these various directions, and in a manner highly creditable to themselves and the profession, are gentlemen who have recently graduated from the dental colleges.

In the ages progress implies deficiency to be supplied, and error to be corrected. It may be doubted whether the perfection of science and art will ever be reached; indeed, I believe it is decreed by an all-wise Providence that endless struggle and approximation should be the law of our intellectual being, the condition on which we have the activity of busy life, and not the sluggish indolence of possession, which is mental death. Recognizing this, it is a source of satisfaction to notice a number of young and generous minds, engaged in the effort to urge forward with eager and emulous hands the ball of progress, and while this amicable struggle continues, little apprehension need be entertained relative to the cause of dental education.

In conclusion, as one who favors and desires the honorable success of all institutions, not only those now in existence, but in addition those which may be established hereafter, I have studiously avoided advocating the claims of any school, and have only aimed to respond with truth and justice to an unjust and depressing assertion, affecting alike the interests of the profession and the community at large, and with the facts and arguments which have been presented, I leave you and the profession to decide whether dental education is tending upward or downward.

At the close of the meeting, a vote of thanks was given to Professor Atkinson for his valuable instruction, and also to Dr. Cummings, of Concord, for the manner in which he had entertained the members of the profession in attendance upon the association. The meeting then adjourned.

MASSACHUSETTS CENTRAL DENTAL ASSOCIATION.

BY J. N. TOURTELLOTTE, M.D., WORCESTER, MASS.

It gives me great pleasure to state the fact that the dentists in Central Massachusetts are becoming more alive to the necessity of united effort in their endeavor to cultivate the art and science of dentistry, and to elevate the standard of professional excellence. A few of us have long felt the necessity of a dental society at home, although most of us are members of the Connecticut Valley or the Boston Society. Accordingly, after a few preliminary meetings, a number of dentists in Worcester and the vicinity met in this city, Nov. 13th, and adopted a constitution and by-laws, and formed themselves into an association to be called the Massachusetts Central Dental Association.

The following officers were chosen for the ensuing year :

President.—Seth P. Miller, Worcester.

1st Vice-President.—A. A. Cook, Milford.

2d Vice-President.—W. N. Snow, Worcester.

Corresponding Secretary.—O. C. White, Hopkinton.

Recording Secretary.—J. N. Tourtellotte, Worcester,

Treasurer.—O. F. Harris, Worcester.

Executive Committee.—H. F. Bishop, Worcester ; John McGregory, Southbridge ; C. W. Estabrook, Worcester.

The meeting was composed of many of our oldest and most skillful dentists, and was marked for its good feeling and earnest endeavor to place our chosen profession, if possible, on a more worthy foundation.

We are to have meetings for discussions, etc. often, and hope to give a more healthy tone to dentistry in this district, as well as create a greater desire for dental literature. The Association voted to send a notice of this meeting to the DENTAL COSMOS, and it gives me pleasure to do so, for we consider it one of our old friends.

OBITUARY.

KILLED at the battle of Cold Harbor, Va., June 1, 1864, DR. FRANKLIN J. CANDEE, dentist ; a member of the 2d Conn. Regt. Heavy Artillery (formerly 19th Conn. Regt. Infantry). He was promoted 1st Lieutenant in Co. H, March 31, 1864.

He was known by many in our profession as a skillful dentist while in practice at Plymouth, Connecticut.

A. C. PECK.

WOODBURY, Dec. 13, 1865.

OBITUARY.

DIED, in Middletown, Connecticut, August 15th, 1865, DR. WILBUR F. KNOWLES. Dr. Knowles was a young man of much promise, and esteemed by a large circle of professional friends. He was a close student, a careful operator, strictly conscientious in all his business transactions, and a sincere Christian man.

Dr. Knowles was one of the original members of the Connecticut State Dental Association. His death is a sad affliction to his relatives, and a loss to the Association and the profession.

JAS. McMANUS, D.D.S.

EDITORIAL.

PHYSIOLOGY AMONG DENTISTS.

In an article on Physiology among Dentists, from Prof. Watt, published in this number, he states that at the meeting of the AMERICAN DENTAL ASSOCIATION, held at Chicago, a "member told us of queen bees being raised from the larvæ of drones, simply by a change of diet." Had such an assertion been made, the proper place to have corrected it would have been on the spot; but no such position was assumed by any one at the meeting. In the course of the discussion a member referred to a *fact* that is generally recognized among *comparative physiologists*, that the *neuters*, or *working* bees in a hive, are females whose sexual organs have not been evolved, the *capacity* for *generation* being *restricted* to the *queen*, but if, by any accident she should be destroyed, that a *neuter* could be developed into a perfect female by a different treatment from that usually adopted during the *larva* state, this consisting in supplying the neuter grub with *royal jelly*, a food of a pungent and stimulating character, very different from the ordinary *bee bread* furnished to the workers, and that the *grub*, under such a course of diet, would come forth a perfect *queen*. The correctness of this position is beyond a question of doubt, for it has, over and again, been asserted as a fact by careful and accurate observers, and is in substantiation of a general recognized law, "that the *character* of the food supplied has an important influence upon the development of *particular parts* of the organism, and may thus modify its general conformation in a remarkable degree."

The sweeping objections to the general character of the discussion on Physiology in the Association are equally open to exceptions; but it is not necessary to dwell upon them, as the facts to the contrary, presented in the able report of the proceedings published in the DENTAL COSMOS, are so palpable and easy of recognition.

J. H. M'Q.

BIBLIOGRAPHICAL.

INSTRUCTIONS IN THE MANIPULATION OF HARD RUBBER OR VULCANITE FOR DENTAL PURPOSES. BY E. WILDMAN, M.D., D.D.S., Professor of Mechanical Dentistry in the Pennsylvania College of Dental Surgery. Philadelphia: Samuel S. White, 1865.

An excellent monograph, of forty-five pages, with the above title, containing a clear and concise description of the various stages in the manufacture of vulcanite as a base for artificial dentures, has been prepared by Professor Wildman for those desiring instruction on the subject, and embodying as it does the process of a careful, accurate, and reliable observer, who has had extended opportunities for thoroughly testing the practical value of the plan which he presents, there can be no question that the profession generally will welcome the publication of this able treatise as a valuable addition to the literature of mechanical dentistry, and that ere long it will be found in the library or laboratory of the majority of dental practitioners.

Deeming the presentation of a summary of the contents as a work of supererogation, the treatise is recommended to the profession, after a careful perusal by the writer, for the reasons stated above.

The engravings accompanying the work, twenty in number, are well executed and thoroughly illustrative of the text. The typography, paper, and the general mechanical execution of the work are highly commendable to the publisher.

J. H. M'Q.

REPORT ON THE USE OF PRESSURE IN THE TREATMENT OF GONORRHOEAL AND PURULENT OPTHALMIA. BY SURGEON JOS. S. HILDRETH, U.S.V., in charge of Desmarres (U. S. Army) Eye and Ear Hospital, Chicago, Ill. Read before the American Ophthalmological Society, June 13th, 1865.

A pamphlet of fifteen pages on the above subject has been received from the author, who has made Ophthalmic Surgery a specialty, and intends to publish during the ensuing year a Treatise on the OPTHALMIÆ, with some of their important complications.

During the session of the AMERICAN DENTAL ASSOCIATION, at Chicago, last summer, Dr. Hildreth delivered a lecture and operated before the members of the Association, and the perfect familiarity which he manifested with the subject treated of, and his skillful manipulations, made a highly favorable impression upon all present.

J. H. M'Q.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

Reflex Action. By C. HANDFIELD JONES, M.B., F.R.C.P., F.R.S., Physician to St. Mary's Hospital and Lecturer on Medicine.—“The chief question with regard to reflex or inhibitory paralysis is, does it depend on an influence exerted on the tissue of the nervous centres, or on excitation of the vaso-motor nerves of their blood-vessels, by which the latter are thrown into a state of anæmiating spasm? The latter is the view maintained by Brown-Séquard. It has in its favor the possibility of explaining on known grounds the occurrence of the paralysis; but against it there are considerations which seem to me greatly to preponderate. It is difficult to conceive that a spasm of remote origin should be limited to such a very small extent of vessels as would be contracted in some instances—*e.g.* palsy of one-sixth nerve, ptosis of one eyelid. Spasms produced by reflex excitation tend mostly to assume a diffuse character. It is almost impossible to believe that a spasm of vessels should be so persistent as the hypothesis requires. In some instances it would be necessary to suppose that the anæmiating spasm had continued for weeks or months. Moreover, we know from the results of embolism that any arterial obstruction continued above a few days in the brain is followed by degeneration and decay of the tissue. This would certainly have occurred in some of the cases which were of long standing if the palsy had depended on anæmia of the nervous tissue. Now, even supposing the excitation to remain in operation all the time, there is no doubt that the muscular contractility would, sooner or later, become exhausted, and the contraction therefore gives way to dilatation. Bernard says expressly that reflex actions of the vaso-motor nerves are manifested by contraction of the vessels followed by dilatation. Besides, on Brown-Séquard's view the cessation of the irritation ought always to be followed speedily by cessation of the paralysis, the vessels again admitting blood into the previously anæmic part; whereas we know that in many cases the paralysis continues long, or even does not come on at all, until after the irritation has ceased to act. Not only so, but a curative effect is sometimes produced by a stimulation of a different kind, as the interrupted current, which would tend to contract vessels. Again, if it be admitted that a nervous centre may be functionally paralyzed from such causes as catarrh, overexertion, insolation, etc., a considerable argument is supplied for the view that a similar state may be induced also in a reflex manner. If, as I shall presently show, neuralgic pain is to be regarded as a condition akin to paralysis, we have in the very frequent instances of reflected pains we meet with examples of morbid action closely allied to inhibitory. In these, however, it can hardly be thought that the nervous centre affected by the primary irritation is necessarily anæmic. Moreover, it may be remarked that the same cause which gives rise to inhibitory paralysis may also produce very different effects, as tetanic spasm, which certainly does not depend on an anæmic state of the centre.

“Assuming, then, that in reflex or inhibitory paralysis, both in its more

and less typical forms, the essential change is in the cells of the nervous tissue itself, and not in the vessels, we will proceed to consider some other instances of this kind of disorder. Dr. Watson refers to the production of amaurosis without visible change in the eye in consequence apparently of irritation of the dental nerves, the blindness ceasing after the extraction of some teeth which had grown irregularly. He quotes from Mr. Laurence an interesting case in which the extraction of a carious tooth with a splinter of wood projecting from one of its fangs, procured the restoration of the sight of the eye on the same side, which had been entirely lost for thirteen months. Improvement in vision commenced immediately, and recovery was perfect by the ninth day. It is impossible that the complete amaurosis in this case could have been due to retinitis, as this would have certainly taken a much longer time to subside, and would assuredly, after lasting so long, have left behind irreparable damage. It is worth remarking for future reference as to the nature of neuralgia, that the amaurosis was attended with severe pain in the same side of the head and face. This I interpret as another paralytic phenomenon. Deafness is certainly a rarer result of inhibitory irritation than amaurosis, but the following case appears to be an example of it. It is related by M. Vautier, 'Ann. par Jamain,' 1861, p. 90. A lady, aged fifty-four, spare and of a nervous temperament, was attacked about four months before he saw her with pain radiating into almost all the teeth, as well as into the muscles of the anterior and left side of the head. The eye of this side was in an almost constant state of lachrymation, and she had become completely deaf of this ear. She was sleepless and without appetite. After the extraction of the left wisdom tooth, which was a little loose and painful, the deafness immediately ceased, and the neuralgia disappeared. The rapidity of the change proves, I think, that the deafness was not the result of inflammation or any structural change in any part of the organ, but a nerve-disorder homologous to the existing neuralgia. It appears to me somewhat remarkable that while reflected pains are so abundantly common, anæsthesia or numbness of like origin is decidedly rare. Both in the more acute and chronic forms of paraplegia produced by cold and wet, Graves states that there is much less impairment of sensation than of motion, and the loss of sensation is never so complete as in paraplegia from disease of the spine. The much greater tendency to impairment of motor than of sensory power in almost all kinds of nervous diseases, organic as well as inorganic, is a remarkable and unexplained fact. Schuh observes that motor nerves require for the exercise of their function a much greater perfection of structure than sensory do, and the restoration of the integrity of the nerve is less easily affected.

"Morbid impressions conveyed from the internal organs are well known to produce depressing effects on the nervous system, just as *per contra* impressions of an opposite kind are attended with a sense of satisfaction and 'wohlsein.' It is known to physiologists that the cravings of an empty stomach are much better appeased when some solid, though in-nutritious material, as earth or sawdust, is mixed with the liquid oil or honey on which some savage tribes are at times reduced to feed, than when the latter are taken alone. On the same ground the Canadian 'voyageurs' tighten their famine girdles to the last holes when the vacuum so abhorrent to nature generally is felt and there is nothing to fill it. In a case under my own care sensory paralysis was the result of gastric irritation. A female, aged thirty-two, had been ailing a long

while. She suffered with stomach disorder of sub-inflammatory character, marked by anorexia, pain after food, and vomiting directly after eating. There was also severe headache, extending from the forehead to the back of the head, constant and not affected by position. Attacks occurred two or three times a week or oftener, in which the left side of the face, and tongue, and left arm became numb, the numbness beginning in the tips of the fingers, and extending upward to the face, lips, and tongue. At these times her speech became thick, and continued so for an hour. Under treatment directed to relieve the inflammatory condition of the stomach, the reflected disorder diminished considerably. The numbness of the thigh which occurs in some cases during the descent of a calculus from the kidney to the bladder is another instance of inhibitory anæsthesia.

“More frequent than disorders of the sensory nerves are those where the intellectual centres are affected. Mr. Langston Parker says, ‘In some persons where the powers of the mind are naturally acute they are singularly depressed after a full meal; some lose the faculty of thinking at all, others become deficient in judgment, and in others again memory is quite lost.’ I was called to the case of a gentleman in the course of last year who was suffering from a sub-acute inflammatory affection of the stomach, who completely lost the faculty of memory after taking a teacupful of food, yet this patient was remarkable for his mechanical genius. A less portion of food did not impair his mind, which invariably became more powerful and clear from leeching or fomenting the epigastrium. Mr. Grantham relates a case (*Brit. Med. Journ.*, June 7, 1862) in which a man, aged forty-eight, who died with symptoms apparently of cancer of the stomach, had been subject to paroxysms of violence, both mental and bodily, occurring more or less after dinner and supper. These exacerbations had gradually increased in severity from the commencement. The following case has been kindly communicated to me by Dr. Palmer: Mrs. H., aged fifty, has had a large family; still menstruates occasionally. Is temperate and regular in her habits, taking only two or three glasses of ale daily. Is subject to tremor of hands and tongue when fatigued or excited at any time; is rather dyspeptic. October twenty-eighth, complained of pain of back and sleeplessness and general debility, but appeared perfectly rational, saying that the cause of her not sleeping was that some actors had been sitting up late in the next house, singing and making a noise. I really thought it was true until her children assured me it was a delusion. As usual when anything ails her, she is in a tremor all over; tongue clean, pulse weak but not hurried, skin perspiring, bowels well open. Complains of pain and fullness of right side in region of liver, which she says feels swollen; the extent of dullness has increased. Is quite cheerful and happy. No cause for this attack discoverable. Ordered full stimulating diet and tr. opii ℥.xv 3tis hōris. Next day pain of back was gone; other symptoms were worse; she was weaker and sick; saw cats, dogs, fires, etc. Still answers questions apart from the delusions quite rationally. Still smiling and merry. Not an hour’s sleep last night. It was determined to try the plan fully, so the doses were doubled. Next day, gets worse and worse; has more delusion, but is as happy as ever. Next day, condition same; rather more pain in right side. The plan was now changed, her meat and stimulus were discontinued, and three grains of calomel were given. In three or four hours after taking the pill the delusions began

to abate; three or four hours later the bowels acted freely (they had been confined for three days before); very soon after she fell asleep, and slept for six hours continuously, having had practically no sleep for five nights. On awaking, the delusions were all but gone, and she speedily got quite well. In this instance the depressing and disordering influence of the loaded state of the liver and bowels on the hemispherical ganglia is plainly apparent. The disorder was of the nature of a paresis, but cannot be attributed to anæmia of the centres. Dr. Tilbury Fox records a case in which symptoms identical with those of delirium tremens were brought on by exposure to cold and wet. The patient was a perfectly temperate man, aged forty-five, but he seems to have had an hereditary predisposition to cerebral disorder. Here also the nervous disorder was evidently of paralytic character, the functional power of the brain was evidently impaired, and the same is true of the following instance. A lady, who had been a very excellent and affectionate mother, displayed unequivocal symptoms of moral insanity. She continued in this state some time, and was at length restored by having a great number of stumps of decayed teeth extracted, which, however, did not seem to have caused any marked pain. In his excellent paper on the symptomatology of worms, Dr. Heslop describes headache and giddiness as prominent symptoms. The headache is almost constant, and sufficiently severe, without being excruciating, to render life, if not a burden, at least unhappy. The giddiness is so severe that the patient often staggers about like one intoxicated, and when this symptom is present to a less degree there is still almost continuously a sense of confusion and insecurity which renders walking a serious effort. Both these symptoms indicate plainly a state of depression, of partial paresis, of some of the encephalic centres. The influence exerted by the uterus on the nervous centres, even on those of the highest order, is very considerable, and from the great variety of the effects produced demands specially to be noticed here. In some cases the gravid condition of the organ evidently causes derangement and depression of one or more parts of the nervous system. Thus it may produce severe frontal neuralgia, gastric hyperæsthesia of the most intense kind, chorea, hemiplegia, paraplegia, deafness, amaurosis, or a state of complete cerebral torpor in which the patient appears like a living automaton, and all indications of mind are in abeyance, or insanity. Instances of all these various forms of disorder are given by Dr. Lever in his paper in 'Guy's Hospital Reports,' vol. v., 1847. The histories of several of the cases seem to make it highly improbable that the manifold symptoms could depend on anæmia of the nervous centres produced by arterial spasm. This conclusion is strongly supported by the fact that the same condition sometimes acts as a beneficial stimulus, improving a naturally irritable temper, and invigorating general or particular nutritive actions. Dr. Churchill states that pregnancy occasionally relieves mental derangement, and mentions having seen a lady who was in a state of confirmed melancholia, which disappeared entirely on her becoming pregnant. Asthma sometimes disappears during pregnancy, and digestion is occasionally more vigorous than in the unimpregnated condition. I am acquainted with one remarkable case in which albuminuria, which had existed for at least fifteen months before pregnancy, ceased during its continuance, at the same time that the health improved and the body gained flesh, which had been observed in former pregnancies. Here there can be no question that a beneficial influence was ex-

erted on the renal plexus—an event which is the more remarkable as the exact converse is the more ordinary occurrence.”—(*Med. Times and Gazette.*)

“*Nerve-force and Electricity.*—The experiments upon the electric organ of the torpedo which have just been published by Signor Matteucci, give another proof of the analogy which exists between nerve-force and electricity. They demonstrate that during the life of the animal the ‘electric organ’ pours out a continuous stream of electricity. Hitherto it has been thought that the electric discharge took place only at intervals. Signor Matteucci, who has tested minute portions of the organ by a delicate galvanometer, concludes that the electro-motor power of the torpedo during the state of repose increases sensibly after the organ or portion of the organ under investigation, has been caused to discharge itself by irritating the nerves. This increase continues for a certain time, and diminishes very gradually.”—(*Lancet.*)

“*The Amaurosis and Deafness of Smokers and Drinkers.*—By MM. SICHÉL and TRIQUET. (*Annales d’Oculistique, Mars; and Gazette des Hôpitaux.*)—M. Sichel, in continuation of a former communication published in 1863, observes that among the forms of cerebral amaurosis there are two which, although little known, are not of infrequent occurrence, and are difficult of cure. One of these, produced by the abuse of alcoholic drinks, he described as long ago as 1837, under the designation of ‘amaurosis symptomatic of delirium tremens;’ and the other, produced by the abuse of smoking, was first described by Mackenzie. Incredulous as to this last, when first announced, M. Sichel, in the course of twenty-eight years’ practice, has frequently met with it, and he believes that there are few persons who can smoke for any long period more than five drachms of tobacco daily, without their vision, and often their memory, becoming affected. In both these forms of amaurosis there is well-nigh absence of all well-marked cerebral congestion, and there is a vagueness in their sthenic or asthenic characters, which may cause hesitation and perplexity on the part of the surgeon, if unaware of the cause in operation. The ophthalmoscopic appearances, as in most old cerebral amauroses, are negative or ill marked. The optic papillæ, sometimes very white, especially in one of their halves, sometimes slightly injected, have their contours ill circumscribed or in part effaced. The retina is but little injected, the central vessels being sometimes normal and sometimes enlarged, the central veins being especially so when the affection has reached its last stage. All the characters observed are, in fact, in common with those of other cerebral amauroses. As in many of these, too, the memory is often enfeebled; and in the amaurosis from alcohol there are frequently trembling of the hands in the morning, and at a later period morning vomiting. Both of these varieties are very slow in their progress toward cure, and very refractory to treatment. Usually observed separately, they may be seen together, and in such cases it is not easy to decide whether the tobacco or the alcohol plays the chief part. The treatment of these cases usually occupies a long time, and an essential point, of course, is the discontinuance of the practice that has given rise to the amblyopia or amaurosis. In the few cases in which there is any marked congestion present, this must be met by antiphlogistics; but when

this is not very positive, bleeding must only be resorted to with the greatest care. As in all forms of passive or old cerebro-ocular congestion, liberal depletion, even by leeching or cupping, and still more even moderate bleeding, soon completes the loss of vision, and this is only slowly and incompletely restored. On the other hand, external and internal stimulants, such as liniments, flying blisters, camphor, strychnine, etc., resorted to before a moderate antiphlogistic and derivative treatment has been put into force, only aggravate the disease. When there is but little congestion, mild aperients are very useful, such as equal parts of cream of tartar and magnesia, alternating with pills of gum ammoniac, sulphate of potass, and aloes. In drinkers these means will not be borne, and minute doses of rhubarb and magnesia may be substituted. Cold water should be applied to the forehead and eyes, while the lower extremities are irritated by sinapisms, dry cupping, etc. At a later period are indicated stimulant liniments to the circumorbital region, flying blisters first to the nape, or behind the ears, and then to the temples; and in very obstinate cases, the various internal stimuli, as camphor, arnica, strychnine, etc., may be tried.

"M. Triquet states that in smokers and drinkers an insidious and obstinate form of otitis frequently becomes developed. There is a kind of numbness or torpor of the ear, with a sense of cold, but rarely any pain. There is no cerumen in the meatus, the membrane and ossicula are in a normal state, and there is little or no vascularity. There is, however, extreme dryness with very minute granulations of the pharynx, nasal fossæ, tubes and middle ear. Frequently both ears are affected, but one has always commenced being so before, and is more deaf than the other. The deafness, without being very troublesome at first, rapidly increases. Noises in the ear almost always exist at an early period, and it is of importance to notice that they assume a hissing sound. The affection exhibits itself in three periods: 1, that of excitement, in which there is intolerance of noise, and a hissing noise in the ear; 2, that of depression, in which the hissing sound disappears, or only remains as a distant and feeble echo; and 3, that of a paralytic condition of the auditory nerve, in which the sense of hearing is more or less completely, and often permanently lost. In this period there are also often trembling of the tongue, embarrassment of speech, and disturbance of vision. The prognosis is very unfavorable, for those patients alone are susceptible of cure who will consent to leave off the bad habit which has produced the affection. For treatment, in the early stages cupping of the mastoid processes and drastic purgatives, and then alteratives, as calomel, sulphur, and small doses of arsenic, are indicated. Locally stimulating fumigations, and weak injections of strychnine or veratrine have proved useful; electricity has always done harm."—(*British and For. Med.-Chir. Rev.*)

"*Nitrous Oxide as an Anæsthetic.*—The use of nitrous oxide gas as an anæsthetic in surgery appears to be rapidly increasing in favor. In a number of capital operations, recently performed in this city, it has been satisfactorily used, the anæsthesia being as complete as that from ether or chloroform.

"At one of the clinics of the Ophthalmic Hospital, Dr. Levis remarked that, in the present state of information in regard to its anæsthetic effects, and with the inefficient means of administration, he thought its applica-

bility to surgery very valuable, but limited. It is yet to be determined whether insensibility from nitrous oxide can safely be prolonged during operations which require much time for their performance. The continuance, too, of anæsthesia while inhalation is effected with the usual tubular mouth-piece, requires the voluntary effort of the patient, which may not always be attainable, especially with children and with persons making resistance under temporary excitement. He believed that it might well displace ether and chloroform in most operations of short duration, and in this class could be included the amputations. A decided advantage, particularly for administration at the clinics, is the rapidity with which anæsthesia is induced, and also the speedy revival of the patient without depression or nausea.

"In many operations in ophthalmic practice it is applicable, but for the operation of extraction of cataract its anæsthesia has not the relaxed and tranquil character which is desirable.

"The preparation of the gas by decomposition of the nitrate of ammonia by heat, and its subsequent purification, are simple, and the cost is probably not one-fourth that of other anæsthetics.

"The present intelligent attention to the subject will soon give a proper appreciation and fix the status of nitrous oxide as an anæsthetic, but we can already, from the present evidence, commend it to practitioners for its safety, agreeableness to patients, rapidity of effects, and economy of use."—(*Med. and Surg. Reporter.*)

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Congelation of Animals.—"At the last meeting of the Académie des Sciences, M. POUCHET, of Rouen, gave an account of a long series of experiments he had been making on the congelation of animals. The following are his conclusions: 1. One of the first phenomena produced by the action of cold is the constriction of the capillary vessels, immediately made visible by the microscope. So great is the contraction that no globule of blood can gain admission, so that these vessels remain entirely empty, whence the pallor of frozen parts. 2. The next phenomenon is the changed condition of the globules. The alterations observed are of three kinds. (1) The nucleus quits its envelope and swims freely in the plasma, the free nuclei having a granular appearance and being more opaque than in the normal condition. The envelopes of the nuclei become flaccid and torn, or they are dissolved and disappear. (2) The nucleus still remaining within its envelope has become opaque, and is more or less excentrically situated. (3) The globules may be simply more or less indented at their edges and of a deeper color. It is especially in the blood of reptiles that the nuclei are found expelled, the globules of mammalia presenting indentations. The number of globules which undergo these alterations and re-enter the circulation is proportionate to the extent of the congelation. When this affects only the limbs, one-fifteenth or one-twentieth only undergo alteration; but when the animal is totally frozen almost all the globules become disorganized. 3. Any animal that has been totally frozen, all its blood having become solidified and all the globules disorganized, must be regarded as absolutely dead and beyond any restorative power. 4. When the congelation is partial, any organ absolutely frozen becomes gangrenous and is destroyed. 5. If partial congelation has not extended very far, so that but few altered globules have entered the blood, life is not compromised. 6. But when

the congelation proceeds over a great extent, the mass of the changed globules which the thawing throws into the circulation rapidly kills the animal. 7. A half-frozen animal may live for a long time if we maintain it in that condition, the frozen blood not entering into circulation; but it dies rapidly if we thaw the frozen parts, the altered globules which re-enter the blood rendering it unfit for the maintenance of life. 8. In all cases of congelation death is due to this change in the blood, and not to the impression made on the nervous system. 9. It results from these facts, that the less rapidly frozen parts are thawed, the less rapid is the invasion of the economy by this altered blood and the greater are the chances of success in the efforts at restoring life."—(*Med. Times and Gaz.*)

"*An Entire Tongue successfully removed during Life.* Exhibited by MR. NUNNELEY to the Pathological Society of London.—The entire tongue had been removed, on the 2d of this month, from a man, aged thirty-five, by a submental opening. He never had a bad symptom, and is now quite well. The disease, which had existed sixteen or eighteen months, became worse two months before the operation, and from the pain and difficulty of speaking, the impossibility of mastication, and difficulty of deglutition, was fast wearing the patient out. He has already recovered strength and flesh; indeed, he says that he is as well as he ever was. Talks with great distinctness and swallows with facility.

"Mr. Nunneley said, in reply to Mr. Barwell, that the patient whose case he had related in a paper read before the Medical and Chirurgical Society remained well for twelve months and then died of consumption. It was remarkable that both of these patients could talk well, in spite of the removal of their tongues."—(*Ibid.*)

"*Necrosis of the Jaw from Decayed Tooth.* Surgical Clinic of PROF. N. R. SMITH, University of Maryland. Reported by J. W. P. BATES, M.D.—Man, 47. Here there is a fistulous opening about midway between the angle and the symphysis of the lower jaw. This man has had this disease for two or three years, and it came from a diseased tooth. Was an alveolar abscess in the first place; these abscesses are often productive of a great deal of trouble. I have seen them extending as far down as the clavicle, and cured promptly by the removal of the tooth. They are very often improperly treated; caustics are applied and stimulating applications, but they are useless so long as the cause of the malady remains. This presents no malignant character. On introducing the probe we touch the alveolar process. These abscesses often follow disease of the teeth—the tooth becomes a foreign body and keeps up the irritation. The pus often makes its way into the mouth and no evil results; at other times it opens through the face and leaves a fistulous opening. It seems strange that a dead tooth should produce such an amount of injury, but as the tooth is dead it acts as a foreign substance does in any other part of the body. We will extract the tooth, which is so much decayed as to render extraction difficult; we will also remove all portions of dead bone. There is a carious surface left, but we will inject with acid. muriat. gtt. x aquæ f3j to dissolve the earthy matter. The last two molars are diseased, and I shall order their removal."—(*Med. and Surg. Rep.*)

“Remarkable Repair of Extensive Injuries.—On the 29th of July last we saw a boy, fourteen years old, admitted into St. Bartholomew's Hospital, whose condition seemed to hold out scarcely a hope of recovery. He had got entangled in some cord-making machinery, and had been rolled by a revolving metal cylinder much as linen is pressed in a mangle. The ecchymosis was so extensive that his face was enormously swollen and of a dark purple color, the conjunctivæ intensely chemosed, and the features unrecognizable. The aspect resembled that of a very bad case of scurvy, or perhaps still more, as Mr. Paget remarked, that condition of dark tumefaction which sometimes precedes the eruption in malignant variola. The boy had sustained, besides, the following injuries: oblique fracture of the left femur; separation of the epiphysis of the right femur; wound near the left elbow-joint, possibly entering it; dislocation of the right humerus into the axilla. There was concussion of the brain, and he lay for many hours in a state of complete collapse. A sixth of a grain of morphia was injected subcutaneously, and this was continued daily. On the 26th of August we found him looking cheerful and completely altered in appearance; there was scarcely any ecchymosis remaining; the wound about the elbow-joint had healed; the left femur was incased in a gypsum splint, and the right had united. When we saw him last, on Sept. 27th, the injuries described were repaired, but he was suffering from suppuration in the neighborhood of the right shoulder-joint. Mr. Eccles, the house-surgeon, who had charge of him, tells us that after the reduction of the dislocation, which was easily effected, inflammation took place, and a large abscess formed, which was opened over the pectoral muscle and in the outer wall of the axilla. It is probable that extensive extravasation of blood took place into the joint at the time of the accident. He still complained of stiffness about the back.

“The case furnishes a remarkable instance of the elasticity of life at this particular age. A few years later, and the lad's hardened tissues would have been crushed probably beyond repair.”—(*Dub. Med. Press.*)

“Fibrous Growth necessitating Removal of the Left Lower Maxilla.—The following case recently fell under our observation at St. Bartholomew's Hospital. It is a striking instance of rapid recovery after a very formidable operation. An old woman of seventy, who had a fibrous growth involving nearly the whole left lower maxilla, was placed upon the operating table. The tumor was growing rapidly, and was so extensive as to require removal of nearly the whole bone. Mr. Callender made an incision through the integuments along the lower border of the left jaw, beginning a little below the ear, and terminating at the symphysis. The bone, having been exposed, was sawn through below the temporo-maxillary articulation, and again near the symphysis, and was removed by very careful dissection. There was a good deal of hæmorrhage, about a dozen vessels requiring ligature. During the progress of the operation, the lingual nerve, passing obliquely downward and forward in front of the internal pterygoid muscle, was very conspicuous. The submaxillary gland was also very clearly shown. To close the wound, Mr. Callender introduced three hare-lip needles, at about equal distances, and twisted silk about them, filling up the interspaces by silver sutures. The patient appeared throughout to be more completely under the influence of chloro-

form (which was administered upon a piece of lint) than is usually the case in operations upon the jaw.

"The after-progress was remarkably satisfactory. The wound through the integuments healed by the first intention. Within three days the patient was eating fish, for which meat was shortly after substituted; and at the end of three weeks she was well enough to return to her home in the country. The structures inside the cheek had by that time become nearly sound, and the old lady scarcely showed a sign of the important loss which she had sustained."—(*Lancet*.)

"*Double Fracture of the Inferior Maxillæ.* By J. L. WYLIE, M.D., Ripley, O.—On the 19th of June, 1865, I was hastily called to visit a gentleman some six miles distant, who had been thrown from a loaded flour wagon, the hind wheel having passed over the inferior maxillæ. Upon my arrival I found him entirely conscious, but laboring from the violence of the shock which his system had sustained. An examination of the jaw revealed a fracture of each side at the junction of the body and ramus, compound and comminuted upon the right, transverse and compound upon the left. There was great contusion of the right shoulder and side of the neck as well as of the soft parts of the chin, defining the course of the wheel; the treatment adopted was as follows: Splints of pasteboard were moistened in water, enveloped in cotton, and moulded to the jaw of each side; the superior extremity pressing firmly against the glenoid process, the inferior extremity reaching the mid-point of the body. A four-tailed bandage was used for the purpose of supporting the jaw as well as for maintaining the splints *in situ*. In addition to this a sub-mental bandage was used for the purpose of giving support to the jaw as well as to keep the anterior surfaces of the fractures sufficiently depressed. Owing to the anatomical conformation of the parts, there was in this, as in similar fractures, but little displacement. The chief barrier to a successful issue consisted in maintaining the position of the parts. This was without great difficulty effected by means of the simple dressings used, without resorting to the more cumbersome and uncomfortable dressings frequently had recourse to in maxillary fractures.

"In the course of twenty-four hours from the adjustment of the fracture great swelling and congestion of the soft parts supervened, in consequence of the fracture itself as well as of the contusion effected by the wheel. Owing to this condition, the patient was entirely unable to swallow fluids of any kind, and asphyxia would be inevitable if the swelling could not be alleviated. At this juncture, a large blister (*emp. canth.*) was applied to the posterior surface of the neck with the effect of alleviating the swelling. Notwithstanding the patient was robust and plethoric, venesection was not resorted to for the reason that union of the right, if not of the left side, would not probably be effected without suppuration on the account of the comminution, and that, owing to that surmised condition, the treatment of nurturing his energy would be more plausible than that of combating an imaginary *sthenia*. As was surmised, suppuration of both sides occurred without any detachment of osseous spiculæ. The pus, constantly of a laudable nature, escaped externally; the wounds kindly healed, the patient speedily gained health, and the jaw is now in *statu quo*. Subsequently to the union of the fractures, a swelling occurred upon the right side of the neck, and despite the most ener-

getic revulsive treatment, suppuration occurred, which was indicated by chills, fever, etc., the usual concomitants of extensive suppuration. It will be proper to remark, *en passant*, that this effusion, swellings, etc., were the results of the contusion at the time of the accident, and related by no continuity with the maxillary fractures. On account of the depth of the pus, the *positive* evidences of suppuration were not discernible, and with the view of revulsion if pus did not exist or with the view of promoting suppuration if it did exist, a blister was applied over the swelling with the effect of transposing the presumptive symptoms for those that were positive. A free opening gave exit to an abundant quantity of offensive pus. After its evacuation, the adynamic symptoms speedily gave way to those of convalescence. Owing to the removal of the patient without the circuit of my practice, I was kindly and ably assisted in the after-treatment by Dr. W. A. Dixon.

"There are, undoubtedly, points of interest attaching to this case. In the first place, the extent of the fractures; secondly, the complications from the contusion of adjoining structures; thirdly, the complete union of the compound comminuted fracture without the detachment of bone; fourthly, the precise preservation of the symmetry of the parts, and we might add, fifthly, the rarity of similar cases in civil fractures."—(*Cincinnati Lancet and Observer*.)

"*An Extraordinary Case of Adhesion.* By WM. MEACHER, M.D., of Pardeeville, Wisconsin.—About a year ago Mr. Kinney, of Marcellon, came to me to have his thumb dressed, having got it injured while hitching a yoke of oxen to a wagon, by getting it caught in the chain.

"Upon examining it, I found that a large piece of flesh had been jammed off, exposing the end and under surface of the bone. The piece of flesh fell on the ground, and Mr. Kinney picked it up (thinking it a good plan to 'save the pieces'), and replaced it, wrapping the thumb up with a bit of rag—in which condition it remained until I saw it, about two hours after the injury.

"After looking at it, I hardly knew what to do with it, for it appeared evident that if I removed the piece (which I did not do at all), and cut off the end of the bone, I could not get flesh enough to cover the stump. Neither did I think I could get flesh enough to cover the stump by amputating at the first joint; for the piece that came off reached half way to the second joint, and the patient objected to having it amputated above the joint. So, hardly knowing what else to do, I secured the piece in its place with some small strips of adhesive plaster, and left it for the present.

"It remained so until the next day, when I examined it again and found the piece apparently alive and healthy. So I concluded to let it alone as long as it kept so, which I did until it grew fast, and sound.

"The princeps pollicis artery was torn off opposite the joint, and drawn out some; and when the piece of flesh was replaced, the end was left sticking out at the side of the thumb, and I was obliged to touch it with caustic to stop its bleeding.

"The patient was over sixty years old. The piece was not cut off, but jammed, or pinched off, and imperfectly replaced, or in other words, coaptation was imperfect.

"We publish with pleasure the article of our esteemed correspondent, yet are compelled to say, that what it narrates is almost too much for

our credulity, and makes us think that the patient has misled his surgeon—and possibly himself, into the supposition that the part was actually severed from all vascular connection with the body. This is so unlike what we every day observe, that we could only believe such a thing possible after undoubted experimental demonstration. As *apropos* to the subject, however, and tending to the credibility of the case reported by Dr. Meacher, we quote from Abernethy's Lectures on the Physiological views of John Hunter :

“ Mr. Hunter was convinced that life might remain in a dormant state, in detached parts, for sixty hours. He therefore could not wonder at the facts with respect to transplantation or engrafting of portions of animal bodies with which he was acquainted; yet he says that the transplanted part must have life, to accept of the union, because he believed, that a correspondent and co-operating action was necessary for its accomplishment.

“ Mr. Hunter observing how firmly the gum sometimes attaches itself to a transplanted tooth, and thinking the comb of a cock resembled the gum in its texture, transplanted the tooth of a dog and set it in the comb, where it became firmly fixed. He next transplanted a gland taken from the abdomen of a cock, to a similar situation in the belly of a hen, where it also became attached, and as he believed, nourished, for he probably thought he had injected it from the general arterious system. The uniting medium by which it is firmly connected, is certainly very vascular, yet I do not see that any injection has passed into the vessels of the transplanted gland. The preparation is in the Museum, so that you can examine it for yourselves. Mr. Hunter probably believed that it was nourished, from its neither wasting nor decaying. As, however, the evidence was not very distinct, he next transposed the spur of a young hen, to the leg of a cock, and that of the latter, to the leg of the former bird, which spurs grew, and thus set the subject at rest in his mind. It may seem, however, curious, that the hen's spur grew to a greater size on the cock's leg, than it would have done upon the parent animal, which Mr. Hunter considered as a proof of the greater vigor of constitution of the male bird.”—(*Chicago Med. Journ.*)

“*Bullet removed from Ramus of Jaw.*—DR. POST presented to the New York Pathological Society a flattened ball removed from the left ramus of the jaw of a soldier who had been shot at Coal Harbor. The ball entered at the junction of the right ala of the nose with the upper lip, passed across the mouth, and was lost. There was a large swelling in the parotid region, and also a sinus which communicated with dead bone. In the course of the operation the bullet was felt and removed, along with a molar tooth of that side, to which roughened and dead bone was attached. The movements of the jaw, which were very much interfered with before the operation, were afterward much improved.”—(*New York Med. Journ.*)

“*Salivary Calculus.*—DR. L. A Voss presented a salivary calculus, removed from the left Wharton duct of a patient, 27 years of age, who came to him complaining of pain in the submaxillary region. On examining the mouth, Wharton's duct was seen very much distended, and its orifice was very prominent. On introducing a fine probe, a slimy

fluid mixed with pus escaped, and the instrument soon struck upon a hard substance which proved to be the calculus, and which was removed by a simple incision. This calculus was confined altogether to the duct, and was of course more easily removed than if it had been in the substance of the submaxillary gland. These concretions were mostly made up of phosphate of lime and chloride of soda.

"Dr. Post remarked that concretions in all the mucous glands were for the most part made up of phosphate of lime.

"In answer to a question from Dr. Buck, as to the size of these calculi, Dr. Voss stated that he had seen six cases of the sort, and in all the concretions were of large size, except in one instance. Dr. Detmold had one case where the calculus was the size of an almond; another one which Dr. Voss had seen, and which was removed by piecemeal through a fistulous opening, was as large as a cherry. It was a curious fact for him to notice that all the salivary concretions which he had seen were connected with the submaxillary gland. He further remarked that these concretions were not unusual in horses, the nuclei of which were formed from some portions of the fodder. In conclusion he referred to a case of concretion in the submaxillary gland which occurred in the practice of Dr. Krackowizer. A probe passed into the duct could not detect the calculus, but a needle passed from the inside into the tumor, struck the hard substance. An attempt was made to remove the stone by an incision on the inside of the mouth, but failed in effecting the object; but finally suppuration and ulceration in the parts took place, and the stone was discharged in fragments.

"Dr. Conant stated that he presented, two years since, a calculus from Wharton's duct, measuring an inch in length, $\frac{3}{4}$ inch in width, and $\frac{3}{8}$ inch thick."—(*Ibid.*)

"*Source of the Phosphates in Bone.*—Large masses of phosphorus are, says Dr. Hoffman's Report, in the course of geological revolutions, extending over vast periods of time, restored from the organic regions of nature to the mineral kingdom by the slow process of fossilization, whereby vegetal tissues are gradually transformed into peat, lignite, and coal; and animal tissues are petrified into coprolites which in course of time yield crystalline apatite. After lying locked up and motionless in these forms for indefinite periods, phosphorus, by further geological movements, becomes again exposed to the action of its natural solvents, water and carbonic acid, and is thus restored to active service in the organisms of plants and lower animals, through which it passes to complete the mighty cycle of its movements into the blood and tissues of the human frame. While circulating thus, age after age, through the three kingdoms of nature, phosphorus is never for a moment free. It is throughout retained in combination with oxygen, and with the earthy or alkaline metals for which its attraction is intense."—(*Report on Chemical Products in Exhibition of 1862. Med. and Surg. Reporter.*)

"*The Dentinal Tubes.*—Some time ago Dr. Beale published a paper in which he declared that the dentinal tubes, or 'Tomes' fibrils,' as he incorrectly called them, are not tubular, but are solid bodies. His statements have now been examined by Mr. S. James Salter, who has published a very valuable essay upon the anatomy and physiology of the

canals in dentine. Mr. Salter demonstrates that the canals are really tubular. He has seen them in some cases present a beaded appearance, evidently due to the presence of bubbles of air in their interior. With regard to their relation of the calcified matter in which they lie, he states that the appearance of a double ring is an optical delusion.”—(*Lancet*.)

“*Modification in Canquoin’s Caustic Paste*.—This valuable caustic would be still more employed were its application not somewhat difficult; and one of M. Demarquay’s pupils has contrived a modification in its composition which renders its application very easy and effectual. The paste thus formed consists of chloride of zinc ten, flour twenty, and glycerin four parts. So prepared it can be applied to the part to be destroyed with great facility, however varied this may be in shape or direction, and can as easily be washed away. M. Demarquay has frequently employed it, and finds the paste thus prepared with glycerin instead of water far preferable, both with respect to its application and the results.”—(*Bull. de Thérapeutic and Med. Times and Gaz.*)

Bessemer Steel.—“One of the most important applications of science illustrated at the last meeting of the British Association was the mode of converting pig-iron into malleable steel by the Bessemer process. This is performed in instruments termed converters; these are lined with fire clay, and are so constructed that blasts of air can be forced in sixty or seventy streams through the melted pig-iron, which is poured into them. The air is forced in at a pressure of twenty pounds to the square inch, and is sufficient to overcome the pressure of the melted metal, and prevent its entering the openings through which the air enters. The air, in passing into the fluid metal, divides itself into innumerable small globules, which pervade the whole of the metal. As atmospheric air contains oxygen, and fluid cast iron contains about four per cent. of carbon, it results that the oxygen of the atmosphere at once unites with the carbon of the iron, producing an intense combustion. By this means a very rapid increase of heat takes place. The iron thus acquires a continual increase of temperature until it arrives at a point hitherto wholly unknown in metallurgical operations. The greatest heat of our furnaces only suffices to render malleable iron sufficiently soft to be indented with the heavy blows of a powerful hammer; but in this process the temperature is so immensely increased beyond that point as to retain the malleable iron in a fluid state. While this increase of temperature has been going on, the large quantity of carbon present in cast-iron, to which it owes its black and brittle character, is removed; and when the whole of the carbon has been thus eliminated from the metal, a known weight of carburet of iron—i.e. pig-iron of a pure quality—is added, so as to restore such an amount of carbon as will constitute steel of the desired quality. The metal, after this admixture, is poured into a casting ladle, and run into moulds. By this means blocks of steel of any desired shape or size are rapidly made. The steel in a heated state can be taken to the rolling-mills or hammers and then fashioned in the ordinary manner.”—(*Intellectual Observer*.)

"An Infusible Crucible.—PROF. JOY, of Columbia College, exhibited to the Polytechnic Association of the American Institute, the jet of a compound blow-pipe, as arranged by M. Deville, of Paris, for melting platinum and other refractory substances; a hollow cylinder of copper or platinum, about half an inch in diameter, embraces the jet, and extends about half an inch beyond. M. Deville found that fire clay was melted by the heat of the flame, and he has been trying numerous substances in the attempt to discover one that would make an infusible crucible. The best substance yet tried is quicklime, entirely free from silica and other impurities. The lime is formed into a solid cylinder, by a hydraulic press; the cylinder is sawed in two transversely; the lower part is scooped out to hold the substance to be melted, with a small channel for pouring out the molten mass, and a hole is made in the centre of the cover to admit the blow-pipe."—(*Sci. Amer.*)

"A Copper Alloy harder than Steel.—PROF. JOY also exhibited some pure silicium, and said that he had seen an alloy of this metal and copper, that was harder than steel."—(*Ibid.*)

"To weld Cast-Steel.—Cast-steel may be welded as easily as iron by using the following flux: sixteen parts of borax and one of sal ammoniac, melted and kept boiling over a slow fire for one hour, and, when cold, pulverized. The steel must then be heated as hot as you dare without burning, the powder strewed over the scarf, and proceed as with any other weld."—(*Ibid.*)

"Curious Facts in Distillation.—In the course of some researches with respect to the phenomena presented during the evaporation of mixed liquids, Berthelot has lately observed some very remarkable facts, of a kind scarcely to have been anticipated. He has found, for example, that if a mixture of two liquids of different degrees of volatility, containing a preponderating proportion of the less volatile liquid, be exposed to the action of heat, it will by no means always happen that the more volatile of the mixed liquids will fly off first. Thus, if one part of alcohol be added to eleven parts of water, and the mixture be heated, the alcohol will not evaporate any more rapidly than the water, although it is much the more volatile liquid of the two. Stop the evaporation at any stage, and the residue will always contain exactly the same percentage of alcohol that was contained in the mixture before the evaporation commenced. In some cases it even happens that the less volatile constituent of a mixture of two liquids flies off first. If, for instance, a small quantity of alcohol be added to a much larger quantity of that exceedingly volatile compound, bisulphide of carbon, and the mixture submitted to distillation, in the vapors which first pass over there will be a far larger proportion of alcohol than in the mixed liquids as originally placed in the retort, and after a little while there will be left in the retort bisulphide of carbon only, the whole of the alcohol having distilled away, notwithstanding that alcohol by itself is less volatile than bisulphide of carbon, in even greater pro-

portion than that in which water is less volatile than alcohol. Similarly, Mr. Carey Lea has found that when a mixture of ethylamine, diethylamine, and triethylamine is distilled, the last-mentioned body, although, when by itself, by far the least volatile body of the three, passes over much more rapidly than either of the others. These facts are very curious, and may prove to have practical bearings of much importance, but in the present state of knowledge they are quite inexplicable.”—(*Mechanics' Magazine* and *Ibid.*)

“*Artificial Ivory.*—Both on the continent and in this country the manufactory of ‘artificial ivory’ is conducted on a scale of some magnitude. The process by which the most successful imitation of natural ivory is obtained appears to consist in dissolving either India-rubber or gutta-percha in chloroform, passing chlorine through the solution until it has acquired a light yellow tint, next washing well with alcohol, and adding in a fine powder, either sulphate of baryta, sulphate of lime, sulphate of lead, alumina, or chalk, in quantity proportioned to the desired density and tint, kneading well, and finally subjecting to heavy pressure. A very tough product, capable of taking a very high polish, is obtainable in this way.”—(*Ibid.*)

“*New Thermo-electric Battery.* Invented by MARCUS, of Vienna.—The force of this battery is derived from heat supplied by gas, the heat, in passing through the battery, which is composed of different metals in bars, being transformed into electricity without destruction of substance. The battery works a powerful magnet, and promises to be of great service.”—(*Med. Times and Gaz.*)

“*Clay and Glycerin for Modeling.*—We read in *Cosmos* that a mixture of clay and glycerin, which keeps its plasticity for any length of time at all temperatures, has been found very useful by modelers. The clay must be well dried before it is mixed with the glycerin. It is said that the mixture can be used in place of wax for the most delicate work.”—(*Chem News.*)

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Chloroform: its Action and Administration. By ARTHUR ERNEST SANSOM, M.D., London, late House Physician and Physician Accoucheur's Assistant to King's College Hospital. Philadelphia: Lindsay & Blakiston, 1865.

This is a reprint of an English work, on the history, properties, and applications of chloroform. In twenty chapters, under appropriate heads and in conjunction with collateral subjects, the author treats of its discovery, preparation and constitution, modes of administration, effects on the system, dangers and means of relief, combination with other anæsthetics, and its special uses in surgery, obstetrics, practical medicine, and dentistry. He therein presents a large amount of valuable information, which is rendered more easily accessible by the accompanying index. It is gotten up in excellent style, and will form an useful addition to the professional library.

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, FEBRUARY, 1866.

No. 7.

ORIGINAL COMMUNICATIONS.

NUTRITION.

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(Continued from page 171.)

IN a preceding communication on this subject, reference was made to the fact that organized beings are constantly borrowing from the earth and surrounding atmosphere the materials that enter into their composition, and as continuously returning them again to the source whence they were derived. The seed thrown into the earth under favoring circumstances of heat and moisture is evolved eventually into the perfect plant, drawing to itself not only the materials inservient to its growth and nutrition, but also absorbing and retaining the forms of force, heat, and light which it obtains from without, to reappear in its organism in that form denominated *vital force*. The same seed, under other conditions, might have remained in a state called dormant vitality for centuries, as is well known to have been the case in those found with mummies taken from the pyramids, whose period of interment was, beyond a question of doubt, at least three thousand years; for on removing the wrappings from these, grains of wheat and corn have been found inclosed, which were evidently placed there, either by accident or design, at the time of embalmment. These, after that long period, have been planted in the soil, and, under favoring circumstances, have fructified and matured into perfect plants. Thus, for three thousand years they had given no manifestations of life, because the necessary conditions of soil, heat, and moisture were absent; but no sooner were these afforded than the seeds became plants. What does this imply? Are we to accept the conclusion of the ancients of the existence of a vital principle which animates and forms the body, protecting it from the effects of chemical action, and, on quitting it, leaving it a prey to this destructive influence, thus assuming the existence

of two distinct things,—dead matter and a living entity, the latter inhabiting the body, composed of dead matter, as living men inhabit dead-houses? Such conclusions, however plausible they may have been regarded formerly, cannot be accepted in this day of enlightenment, for it is in opposition to all the evidences now afforded by science—of MATTER and FORCE. Of the former or MATTER, it cannot be said at any time to be essentially dead or essentially living; for that which would be regarded as living to-day will be to-morrow dead, and that which is dead to-day will be living to-morrow. These terms of *living* and *dead* are merely indicative of certain *phenomena*, which are only manifested under certain conditions. Of the latter or FORCE, it pervades the entire universe, manifesting itself at one time under one form, and at other times under apparently dissimilar forms, and yet all correlated, conserved,—modifications of one great force. Thus motion, heat, light, electricity, magnetism, galvanism, vital force, etc. are only different manifestations of force made apparent to us through varying degrees of a rapid, vibratory movement among the particles of matter. *Vital force*, therefore, like force in any other form, merely indicates that dynamical condition of the organism by means of which it maintains its integrity of structure, not *resisting* or overturning the operations of chemical action, but rather *repairing* the destruction or waste of tissue incident to such operations.

(To be continued.)

ABSORPTION OF THE ALVEOLI.

BY WM. H. ATKINSON, M.D.

Read before the Brooklyn Dental Association.

THIS term comes from two Latin words—*ab*, from or by, and *sorbeo-sorptum*, to sip, or drink slowly; hence legitimately absorption signifies, by slowly drinking or imbibing. Therefore absorption of the alveoli involves the necessity of their reduction to a fluid state.

Alveolus, a little hollow, properly signifying the pit or cavity in which the root of the tooth sits in the jaw and cannot possibly be dissolved, being a mere space. But by a loose habit of speech we say alveoli, when we mean “alveolar processes,” which may be properly dissolved by any agent capable of effecting this change. Both transverse and internal and external alveolar processes are bones; the two latter quite dense, while the former is spongy or cancellous, and necessarily more liable to solution than the denser plates.

Absorption really is just one-half of the rôle of nutrition, solution, and consolidation.

The discussion then for this night involves physiological and pathological phenomena. I presume the intention of the committee who supplied

the subject was to call out whatever of knowledge we possessed upon the subject in general, as well as in that particular form of undue absorption of the margins of the external and internal alveolar plates that have so much annoyed us in patients who have taken great care to clean thoroughly the valuable organs sustained in position by these bony walls.

In the review of the subject before us, our minds naturally recur to the oft-repeated query, What causes absorption? To which I would reply, that we have no knowledge of absolute primary cause of any physiological or pathological act short of the complete answer to the how and the why of formation, growth, and full development of individual body involving the mysterious movements denominated nutrition. Then as our knowledge is but in part, we must rest satisfied with the statement of conditions which we regard in the light of cause. These may, for convenience sake, be divided into constitutional or general and local expressions of this force, both of which must be present at the time, and simultaneously active to become apparent to any scrutiny which we are as yet capable of exercising.

There are two principal constitutional causes or poisons, to wit: Syphilization and mercurialization, which assume such protean shapes as to be next to impossible to diagnose their distinct, veritable presence.

Local causes are reducible to a single expression in mechanical force. Let us first attend in detail to a few examples of the ravages consequent upon the introduction into the circulation of these viruses that so simulate each other in their destructive work. The poisonous impression of mercury induces solution of the lime-salts in the cancellous trabeculae of the transverse processes and the dense margins of alveolar processes, where they merge into the dentium ligamentum. This is an example of solution over consolidation, which, when in true balance, constitute the normal nutrition of the part. At this point very slight mechanical pressure will so displace the now excessively vascular surroundings of the teeth as to denude their necks of their covering and protection, to a greater or less extent, proportioned to the force exerted and time of its continuance.

Where deterioration of functional activity be considerable, necrosis of the dense plates may follow with all their dreaded consequence, demanding the highest skill to prevent extensive destruction of parts. This, I am happy to say, may now be done to an extent hitherto unknown in the conservative surgery of the mouth.

If solution be checked before mechanical displacement takes place by suppurative action or simple pressure, and the proper constitutional remedies be administered, we may have recalcification of the hard and cancellous portions of the alveoli, thus preventing the loss of these by unwelcome absorption.

Many stages and phases of mercurialization may present themselves, varied in benignity or malignity, in accordance with dose, constitutional

tendency, cleanliness, or neglect thereof, involving a very close scrutiny and some experience to differentiate them from like conditions arising from syphilitic poisoning.

Unfortunately for the patients, dentists seldom see them in the stages of this trouble while it is possible to effect the highest good, to wit: preserve the connection between the margins of the gums and the necks of the teeth intact, forming pockets in which to hold the plasm out of which nature so nicely reproduces these attachments and supports.

Hence the majority of cases must be content with securing partial reproduction and perfect calcification, holding the teeth firmly in place, albeit with their necks denuded of their natural covering and support.

But teeth so situated are infinitely superior to the best artificial substitutes, although good management and much care are requisite to overcome the sensitiveness of cement and dentine that so often follows this kind of exposure.

Absolute freedom from foreign deposits—mucus, alkaline, or acid—must be insisted upon to secure the exposed points from deterioration, decay, etc. etc.

Wherever absorption has separated these connections, open mouths or pockets present a favorable nidus, in which lime and other material so readily finds lodgment and consolidation, especially in the inferior maxilla, rendering it impossible that adhesions should take place between the soft and hard tissues.

When this condition has once presented itself, the continued accumulation accretes further and further, encroaching upon the soft parts, and hastening their loss by thus inducing absorption. Astringent washes and detergent powders, with a vigorous use of a not too stiff brush, will very materially arrest the rapidity of this destructive process. But that it may be cured, mechanical removal of the foreign accumulation becomes absolutely imperative.

We cannot here enter into the full detail of this cleansing process, but I would most earnestly suggest the great necessity of doing it well: and this requires much more patience, time, delicacy, and faithfulness than usually falls to the lot of such teeth to meet with. When this is properly done, involving all the before-named conditions with the additional one of enhanced expense so often standing in the way of the performance of good work, a success hitherto almost unknown in such cases awaits to bless the patient and gratify the complacency of the operator.

It has repeatedly occurred to me to be able to take a tooth, on one side of whose root dark-brown and green deposit of hard calcareous matter had found lodgment, inducing absorption of hard and soft parts in juxtaposition rendering the tooth a source of constant annoyance, pain, or agony, which caused the possessor to desire its extraction, and, after careful removal of this foreign deposit, and dressing with creosote and iodine,

creosote alone, wine of opium, tincture of aconite, or tincture of arnica, 1, 2, 3, or all of these in due succession, as the case demanded, to succeed in re-establishing normal connections and usefulness of the tooth or teeth so situated.

So although absorption of the entire alveolar processes is past remedy, when the soft parts also are severed from their connections at the necks of the teeth, yet where this attachment still retains its hold on one-half or more of the circumference of the tooth or teeth, the case is amenable to successful treatment.

Syphilization, scarcely distinguishable from the foregoing by the novice, unless very minute and accurate detail of the history of the case be at hand and apprehended, fortunately for the patient and practitioner, requires a very similar treatment, when advanced to a stage where the similarity almost seems to be identity.

Nevertheless, there is a difference and a cognizable one to him who takes a survey of past and present condition of the whole system of soft and hard tissues. The especial distinction apparent in the maxillæ is the greater frequency of necrosis of the bodies rather than the borders of the alveolar plates, and the preference given by the syphilitic virus to the superior maxilla rather than the inferior, which mercurialization seems to prefer.

In this hurried sketch, I perceive my mind has been led to dwell principally upon the pathological cause and consequence of absorption of the alveoli.

I am not satisfied, however, to dismiss the subject of absorption of these processes, without making some reference to normal absorption of these bodies as exemplified in primary and secondary dentition.

It is well known that each tooth is inclosed completely by bony walls during its early stages of calcification. This is true of both sets of teeth.

To be sure, the deciduous set are inclosed in alveoli paper-like and frail, when compared to the permanent set.

The eruption of every tooth that is normal in mode of development involves the absorption of that portion of the bony cell in which it is formed in a line with the axis of the tooth at its coronal extremity. Just here arises a very interesting histological query, to wit: How does it come to pass that the free border of process is so nicely adapted to the inequalities of the neck of the tooth? To me it seems quite clear that the *mechanical* pressure of the developmental process, urging the tooth against this wall at the point thereof, thus impedes and obstructs the capillary circulation, arresting nutrition of the osseous territory at this point, and thus the exact amount of solution is effected mechanically. It may be necessary to present an argument or two in favor of this statement. All that is necessary for me to triumphantly vindicate the accuracy of this

statement (in possibility at least) is to direct attention to the beautiful beds or tracts hollowed out by blood-vessels everywhere throughout the entire skeleton, but especially within the calvarium. At this point, it is evident that no hard substance could be invoked as the cause of pressure that effected the delicate forming of the channels in the vitreous table in which the arteries of the meninges of the brain lay so securely enconced.

Another example of mechanical pressure of a soft body producing absorption of bone is the oft-observed wasting of bones against which aneurismal sacks have been developed. Without further multiplying examples in physiological and pathological fields of research, permit me to express my conviction that this very mechanical pressure is the true cause of the absorption of bone in every instance where it is locally expressed.

If any are disposed to take exception to my statements, I feel assured that it is in consequence of the lame manner in which I have been able to make them rather than for a want of apprehension of the philosophy that lies behind, and is the cause of the force denominated mechanical.

I have just stated my conviction that all absorption of bony tissue strictly local in character depends upon mechanical pressure.

Now, throughout the entire range of the observations I have been able to make in strictly physiological fields they have confirmed me in this opinion.

Molecular action is doubtless without limit in power wherever expressed. We must needs go behind this expression of force to direct, modify, or prevent the results dependent upon this force when in action.

That modification of force, called "gaseous diffusion" or "interpenetration of gases," when apprehended, throws some light upon what is meant by molecular force or nutrient force, which is a resultant of molecular force.

Mechanical force is the impingement of one body upon another, or displacing of a body in space. What I have said of constitutional and local causes of absorption involves mechanical, chemical, and what has been called *vital* movements. These, as we find them in separate and combined activity in physiological and pathological expressions, are so complicated and interdependent that distinct and clear aphoristic statement respecting them becomes exceedingly difficult to pronounce. But there is a result of mechanical pressure that has been called "idiopathic absorption" of the gums and processes, demanding our attention as intelligent practitioners of dental surgery, that we should no longer neglect nor blunder at, as has been the universal custom. I refer to the wasting of the external soft and hard covering of the teeth, usually most apparent in the incisors, cuspidati, and bicuspides. I am fully satisfied that this is caused by the too frequent and vigorous use of *stiff* tooth-brushes.

It is well known that continued friction has a tendency to obliterate subcutaneous cells and vessels, and induce wasting or consolidation thereof. The thickened cuticle of the hands of laborers and of the soles of the feet are examples of the results of friction. No less do I refer the absorption of the cellular tissue, tendinous structure, and periosteum of the toes and feet, in the exquisitely sensitive examples of corns and bunions, to this same unwelcome and distressing mechanical pressure.

The proofs which are offered justifying my statement are in the universally observed fact of complete cure following the removal of the mechanical pressure in all such cases.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from p. 293.)

Exostosis and Inflammatory Tumors.—These two classes of growths have such parallelism that their consideration runs naturally into one another.

The term *Exostosis*, as the reader will recall, is derived from the expressive roots *εξ*, out of, and *οστέον*, a bone, an osseous tumor which forms at the surface of bones, or in their cavities. The first is called *Exostosis*, the latter *Enostosis*.

The following varieties have been enumerated: *Eburne exostosis*—ivory exostosis, that which is ivory-like; *lamina exostosis*, that which is made up of distinct fibres or layers; *spongy exostosis*, that which is like the spongy tissue of bone.

Inflammatory tumors of bone are those having a marked origin, as the syphilitic, the scorbutic, and the tubercular.

Exostosis proper is strictly benign; it is generally recognizable by its extreme slowness of growth; the entire absence of pain, except when it has some peculiar obstruction; and its freedom from surrounding disease. It does not tend to ulceration, and does not—except mechanically—affect the parts even most directly associated with it.

True exostosis has its origin in local irritations—perhaps always. It is true that reference is made by authors to an ossific diathesis, but, as truly remarked by Miller, “a skeleton so susceptible is prone rather to the more common inflammatory products of caries, abscess, ulcers, and necrosis.”

That a local irritation is the chief cause of exostosis, is satisfactorily proven, I think, by reference to parts most subject to this interference. The teeth, for example, are found exostosed in a thousand instances to one, of any other bone, and certainly no bones are so constantly found

in irritative conditions. I use the term "bone," reminding the reader that the portion of the tooth which takes on this morbid action is almost, in every proper sense, true bone.

Non-specific exostosis occurring on any portion of the maxillary bones removed from the alveolar borders is an exceedingly unfrequent affection. With every opportunity for observation, I am surprised at the fewness of the cases I recall ever to have seen; and all these have been small, and of little consequence.

Around the base of the alveolar processes, however, and particularly on the lingual aspect of the lower jaw, this affection, in a minor form, is exceedingly common; certainly I have seen hundreds of examples, the enlargements varying from the size of a small shot to that of a rifle-ball! As pathological relations are concerned, however, they seem of little consequence; I never knew one to result in any harm; the treatment I have adopted in such cases has been the very simple one of letting them alone.

It is not improbable though that cases may present when operations seem demanded. I have felt called to operate on some two or three of these. The mode of procedure is simply to lay off from the tumor the soft parts, and, with a chisel, cut away the mass; there is no hæmorrhage or other trouble attendant on the operation.

Exostosis of the fangs of the teeth—*exostosis dentium*—the usual seat of the disease in the maxillary regions, finds location both in the cemental and dentinal structures of these organs; for while I have seen two or three cases where the crowns of the teeth were enlarged, as if from a species of exostosis or hypertrophy, yet these were so anomalous that I may describe the growth as being associated exclusively with the fangs; and even here, I think, it will be found in the majority of instances confined mostly to the apex, growing, bulb-like, as it were, about the end of the root.

The diagnosis of exostosis in these situations is not by any means easy. The most frequent pathognomonic feature, however, is a sense of continued uneasiness about the parts, not generally amounting to pain, but serving as a constant reminder of the presence of the tooth. The tooth itself may or may not be carious. Pressure or the stroke of an instrument does not, in ordinary cases, either increase or diminish the soreness; the sense of fullness about the parts is particularly observed where the absorption of the alveolus is not proportionably active with the exostosis. In these latter cases, the extremest symptoms of neuralgia are not unfrequently produced, and which, not comprehended, are of course treated without avail.

One of the most remarkable cases of dental exostosis on record is related by Mr. Fox. The subject was a young lady, who, at the time she sought the professional aid and advice of Mr. Fox, had suffered so severely and

so long that the palpebræ of one eye had been closed for nearly two months, and the secretion of saliva had for some time been so copious that it flowed from her mouth whenever it was opened. She had tried every remedy which had been recommended by the ablest professional advisers, without realizing any permanent benefit, and she was only relieved by the extraction of every one of her teeth.

The practitioner may infer from the mention of this last case that he is likely to meet with every gradation of the trouble. The only cure will consist of course in the removal of the affected member: this, after the diagnosis, is always easily accomplished with the aid of a pair of cutting-forceps.

In the venereal, scorbutic, and tubercular hypertrophy or exostosis of the maxillary bones, the features of the common disease become quickly evident, in the local trouble, so remarkably so, indeed, that no one would be at all likely to misunderstand things, presupposing that the general disease is understood. The growths are rapid, painful, and always more or less amenable to constitutional treatment.

Scrofulous and scorbutic tumors differ from the venereal in being more loose and spongy in structure, and, in consequence, more apt to run into abscess, being possessed, as it were, of elements for their own destruction.

In these forms of maxillary disease, the lesion is commonly heralded by deep-seated, dull pains, which precede by some time the visible enlargement of the part. After the tumefactive process once sets in, it goes on, if uncombated, until the parietes of the bone are completely disparted. Associated with this enlargement of the bone, is an unhealthy condition of the soft parts: the gums become pallid, and are, of course, more or less attenuated, the paleness being the result of the attenuation.

As the disease advances, the centre of the tumor softens, while the character of the pain changes, becoming sharp and throbbing; as pus forms, sinuses are created, and thus ulcerations occur on the face of the tumor.

The treatment of inflammatory tumors of these and similar types is to be conducted in consideration of their twofold requirements. The systemic influences are to be corrected, while locally, I think I am justified in asserting, that, as a rule, they will succumb to the treatment commonly directed against similar abscesses of the soft parts. I have great confidence in the use of tents and stimulating injections.

There is a simple inflammatory tumefaction of the maxilla which I have sometimes met with which might be mistaken for specific exostosis. It is to be distinguished, however, by the greater rapidity of the swelling and by the greater soreness attendant on it; it comes as a cold in the head, or on the chest comes, without, in the majority of cases, the patient

being able to assign any cause, and it is found soon to give way to the same class of antiphlogistics. This tumefaction is extra rather than intra-maxillary; it is, more than likely, a periosteal exudate; it has, of course, no constitutional associative lesion.

(To be continued.)

CRYSTALLIZED GOLD.

BY GEO. WATT.

THERE is but little doubt that gold will long retain its place as a material for filling teeth. There are objections to its use; but it is not probable that these will all be overcome, nor that any other substance will be found less objectionable. But whether foil is the best form of gold, for dental purposes, is an open question.

Crystal gold was introduced, to a limited extent, a dozen of years ago. I am not able to speak positively; but I presume there is but little more of the article used now than ten years ago. The slowness of its introduction is presumptive evidence of its want of merit; and, unless this tardiness can be satisfactorily explained, we are warranted in concluding that the article is not worthy of special attention. But before condemning, let us notice a few facts.

The first teeth filled with it are good yet—the teeth good, and the plugs good—and this, notwithstanding the fact that very defective instruments were used, and but little was understood as to the proper manipulations in filling with crystal gold.

Good operators have used it from the date of its introduction till the present time; and they have used it successfully too; for without success, they would have abandoned its use.

When the crystal gold is of the proper density and texture, a welded plug can be made, either by mallet or hand pressure, in half the time required to make a similar one of foil. If welded plugs are superior to those formerly made, we are indebted to the use of crystal gold for the idea. Then why, at the end of twelve years, is it so sparingly used? Another series of facts may explain.

The preparation of crystal gold, with but a trifling exception, has been in the hands of, and under the exclusive control of one man, and he not a dentist, and, consequently, ignorant of what is wanted, and not able to judge the results of his own experiments. On account of this want of *practical* knowledge, or for some other reason, the crystal gold in the market is far too spongy. If it were three or four times as dense, with definite crystals, and the proper plasticity, it would be much better than it is. If it were thus prepared, of uniform texture, no dentist who once

gave it a trial would think of doing without it. It has been thus prepared.

I have seen more than one specimen, having a specific gravity about four times as great as that of Dr. A. J. Watts' most dense variety, equally as plastic as any of his numbers, and so adhesive, that a thin cake of it could be cut into a "rope," which could be manipulated like a "rope" of foil in one of the old methods of filling, not a crystal falling off or being wasted. Such an article, kept in the market, would go into nearly universal use, in less than five years. Then, why is it not in the market?

Well, crystallized gold is a result of a complex series of chemical actions. So many affinities are in play, and so many circumstances modify these affinities, that uniform results are, perhaps, impossible. And, at any rate, to be successful, more minds should be engaged on it; but such is not likely to be the case, while it is fenced in by a patent; and while the proprietor of the patent is so exclusive, and so inaccessible. A free exchange of ideas is necessary to the development of any great improvement. I once had something to do with the preparation of a "crystal gold," about as much like the New York article as a Boston cracker is like a five-penny loaf, without a shadow of suspicion that I was infringing the patent. I make it yet, but solely for my own use, and even that, only because I cannot get what I want manufactured. I wish some one, willing to follow a business so unpleasant, would supply the profession with such crystal gold as I have seen.

The great reason why crystal gold has made so little headway in the profession, is to be found in the character of the early operations. When we look back to the days of its insertion with smooth, blunt pluggers, or with bur drills, we can but wonder that any operations were successful. It is so easy to make crystal gold stay in a cavity, for the time being, and so easy to put a good finish on a dense surface, while the main body of the plug is left porous, that it is not strange that many very imperfect plugs were made. Such plugs gave way in a few months, or a year or two, and their failure was attributed to the gold, instead of to the manipulation.

When all the facts are taken into consideration, it is not wonderful that the introduction of crystal gold to professional favor has been slow. The wonder is that the crystalline preparation has held its place at all, amid the many improvements, both in the manufacture and manipulation of foil. That it is still used by some good dentists, I regard as a strong and conclusive argument in its favor. That it has survived, under all the disadvantages of its introduction, certainly speaks well for it.

Sponge gold, more or less crystallized, may be prepared by a variety of methods. How that in the market is prepared, I am not able to say; but, certainly, not by the specifications accompanying the patent, as they

are given in Kendall's "History of Dental Patents." By following the directions thus given, an article like that in the market cannot be produced; and we have the statement of Dr. Ballard, at the American Dental Convention, in 1856, that, being a confidant of the manufacturer, he was able to state that no mercury is used in its preparation. This statement was made to quiet the fears of those who dreaded the presence of mercury with the gold; but these fears were never well founded, as any remaining mercury would be dispelled in annealing. (So would any remaining acid.)

The best specimens I have ever seen were prepared by, substantially, following the patent, observing, however, a number of precautions *necessary* to success. Without these precautions, a useful article cannot be produced; and for this reason, the patent is, no doubt, defective. But defective or not, I am inclined to respect it, and advise others to do so too; but feel like urgently insisting on the patentee to give us a good article.

A minute description of the manipulations used in preparing the best specimens I have seen may not prove uninteresting. Allow me to say that I had no *hand* in the process. I simply inspected the chemicals and turned them over to a manipulator, who brought out the results referred to.

The gold is rolled out as thin as convenient, and dissolved in *aqua regia*, prepared by mixing one part, by measure, of nitric acid with three of hydrochloric acid. The acids must be chemically pure. The silver is converted into a chloride, which is insoluble. The solution, of terchloride of gold, is to be poured into a deep glass jar, the chloride of silver being washed with pure water to remove all the gold solution. These washings dilute the gold solution sufficiently. Then a clear, saturated solution of protosulphate of iron is slowly added, till the gold is all precipitated as a brown powder. The precipitate is thoroughly washed and dried, after which it is combined with mercury by friction with a pestle, in a wedgewood or glass mortar. As the metals combine, much of the mercury is oxidized. The oxide is removed by washing with alcohol or warm water. The proper quantity of mercury cannot be ascertained by weighing, as far more of it is oxidized sometimes than at other times. The amalgam should be sufficiently fluid to run perfectly level and smooth on the flat bottom of a glass dish or basin. The glass basin containing the amalgam is to be placed in a steam bath, and nearly filled with diluted nitric acid. The acid should be so dilute that red or orange fumes are barely if at all visible, from its action on the mercury. When the mercury is all dissolved, the gold is to be washed free from acid and annealed to a bright-red heat.

Now, all this appears easy; but if twelve individuals were to try to make crystallized gold by this process, there would probably be at least

eleven failures. A great majority in our profession entertain the idea that all they need is a recipe for making crystal gold. They think that thus posted, they could prepare it as readily as a druggist prepares Dover's powder; and those who know the least about chemical science, are the most confident of their ability to succeed, and are impatient, and even petulant, when told in the most friendly way that they are not competent.

The difficulties to be met in preparing crystal gold have to be practically encountered to be fully appreciated. The chemicals must all be absolutely pure. One per cent. of tin or lead in the mercury, will render perfect success impossible. The presence of oxide of mercury in the amalgam insures a defeat. Too rapid action of the acid, in removing the mercury, has a bad effect. Irregular action is no better. These difficulties, however,—at least some of them,—can be overcome. But there is a greater difficulty than these not so readily managed, if manageable at all. I allude to the influence of atmospheric electricity. This will be the better understood by a few considerations. Electro-magnetism, or magneto-electricity, is the acknowledged agency in crystallization. In the amalgam, acted on by the nitric acid, the minute particles of gold and mercury are in intimate contact. When two metals are acted on unequally by an acid, the one becomes positive and the other negative. Galvanic currents are established. The decomposing powers of galvanic batteries vary inversely, as the square root of the distances between the excited surfaces. But the distance between a particle of gold and one of mercury is imperceptible in the amalgam under consideration. Hence, the chemical power of the minute currents is exceedingly great, in proportion to the quantity of electricity set in motion. The form and size of the crystals are modified and controlled by these minute currents; and these currents are, in turn, modified by the electric condition of the atmosphere. I have repeatedly seen a change in, or an arrest of the process of crystallization, caused by the passage of an insulated cloud, a total defeat resulting where everything previous had promised success. The main object in using the glass vessels and steam bath is to counteract this atmospheric influence; and it is probably owing to it that the results are usually less satisfactory in summer than in winter.

Now, if some member of the profession will devise a method of overcoming this electric difficulty, he will confer a favor on his brethren and the public, beyond anything that has yet blessed mankind through the instrumentality of our specialty. Perhaps no other field will so well pay for research. Let active, inquiring minds turn their attention in this direction, and good will follow.

It is not necessary to detail other methods of preparing crystalline gold. A mode that has produced, in a few instances, an article far superior to anything ever offered for sale, an article that can be cut into

strings, and the strings tied into knots, is the mode that should be investigated, till its capabilities are developed and understood to the extent necessary to produce uniformly such good results. Hoping for something of this kind, I leave the subject.

DIFFERENT MODES OF FILLING TEETH.

BY J. T. CODMAN.

Read before the Massachusetts Dental Association, November 6th, 1865.

Mr. President and Fellow-Members:—The subject of which I propose to write being in order for discussion this evening, I present to you this hastily written essay for the purpose of reviewing the different principles applied in filling teeth, with some reference also to the materials used, in order, if possible, to fix the subject in our minds more clearly, and to define, unmistakably, each mode by itself, thinking that thereby I may clear up what often appears to be an error, or certainly an ambiguity in some explanation or teaching by the lecturer occurring to the mind of the listener, such mistake being made by the radically different way or principle applied by one or by the other. I also thought that I might do this without even expressing, for the present, an opinion as to which plan is practically best, or which particular mode I generally prefer.

I have divided the subject into four branches :

First. Wedged or Non-Adhesive Gold Fillings, with Tin as an adjunct.

Second. Packed or Adhesive Gold Fillings.

Third. Self-Consolidating Fillings. By this term I call all those fillings in which chemical change produces the principal portion of the permanent solidity of the filling.

Fourth, and last. Plastic fillings or fillings softened by heat.

These four branches cover all fillings that I am acquainted with.

WEDGED FILLINGS.—A wedged filling is my term for a filling of gold or tin, and very rarely of any other material, that is placed in a tooth in portions and there consolidated, the consolidation being dependent on and supported mainly by the strength of the walls of the cavity in the tooth. These fillings are composed of pellets, folds, strips, rolls or cylinders of foil. Other forms are used, but these are the most common. These pieces are placed with more or less precision into the cavity until it is full. The main principle in this style of filling is, that each piece of gold or tin is wedged or compressed against the piece that precedes it, and the whole filling is dependent for its retention in the tooth on the final wedge or piece called the key—each piece, like the links of a chain, depending one upon the other, any piece being misplaced or loosened, loosening all the others.

These fillings are consolidated in two different ways :

The first, which I shall call the *primary mode*, is by condensing each piece with a reasonable amount of pressure, and finally condensing the whole plug or filling with considerable force either by packers or by the use of plugging forceps. This mode, it will be seen, strains hard upon the walls of the tooth, and though generally effective, is superseded by a majority of practitioners by the *second mode of condensing wedged fillings*, which is to condense to its utmost each separate piece of wedge as it is placed in the cavity so that when the cavity is full the filling is nearly consolidated, but little work remaining to be done, except to condense the surface and put a finish on the filling.

In the two fillings mentioned, no dependence is placed on the adhesive quality of the material used, and, excepting that all pure, clean gold foil will unite on sufficient pressure, and consequently a surface of gold, partly adhesive, presents itself, no special or *primary adhesion* is looked for. This style is superseded by some practitioners by that of

PACKED FILLINGS.—I like the name of packed fillings in contradistinction to wedged fillings. The gold is packed in the tooth as you would pack a trunk with choice goods, with but little strain on the walls of the cavity. The filling may be said to be packed against itself, and only a thin exterior portion of the filling is packed against the walls of the cavity.

These fillings are composed of gold adhesively prepared, and the portions are united by the *adhesive principle*, which means the actual welding of the gold. The portions are generally made of long strips, folds, or parts of leaves lightly crumpled, and the gold, if not already prepared, is made adhesive by heating it to a red heat in some clean flame or vessel. Crystal gold, a preparation of gold that assumes a crystalline or granular formation, is used in small pieces irregular in shape and size.

The principle applied in adhesive filling is to condense each piece or the particles of each piece to its utmost, as they are successively placed in the tooth, attaching each piece to the former one, by the rough surface left by the packing instrument which is sharply though not deeply serrated, so that the whole filling becomes a *single piece* or *mass*. It then becomes the highest type of a *packed filling*; no after-condensation can improve it but injures it, as being one solid mass it must move bodily from its proper place if pressed upon too violently. A surface condensation or finish may be made, however, without injury. Broken corners and missing portions of teeth can oftentimes be replaced by adhesive gold filling.

There is another filling that will be in place to mention here. I call it a

COMPOUND FILLING.—It is made of gold and it is claimed that the elasticity of non-adhesive foil is taken advantage of in connection with

adhesive gold. The base of a compound filling is made of condensed non-adhesive foil, and the remaining portion is made of adhesive gold, crystal gold being most in use for the purpose. There are strong advocates of this mode of filling. Non-adhesive foil, as prepared by some makers, has a power of *retention* when placed in the bottom of a cavity, seeming to be a certain amount of elasticity which does not allow it to draw away during condensation from the edges of a cavity in which it is placed, making a fine base to which crystal gold can be added until the filling is finished. We now come to

SELF-CONSOLIDATING FILLINGS.—By this term I call metallic amalgams and os-artificiel or the oxychloride of zinc, which as far as I know are the only ones worthy of mention in this connection. As I do not propose in this essay to instruct, but to describe, I will only say that amalgam is made of filings of silver, or silver and tin, either first melted together or mixed afterward in filings, with a proportion of metallic mercury to amalgamate and cause chemical change and union, which it is said produces crystallization of the mass, certainly producing hardness after the surplus mercury is removed. Gold, platina, and cadmium have also been introduced into amalgams.

Clean materials with a clean cavity is necessary; and although we may principally depend upon the chemical change for the durability of the filling, it is necessary that the filling should be conscientiously packed into every crevice in the cavity. Under the best circumstances, the filling hardens rapidly.

Oxychloride of zinc, under whatever name it may be sold, as odontoplasma, osteoplastic, os-artificiel, is simply the oxide of zinc, a dry, white powder, combined sometimes with powdered silex, and colored with the oxide of titanium, which is then mixed with a partially diluted solution of chloride of zinc, an almost colorless fluid, which then commences to consolidate something after the manner of plaster of Paris. This also should be packed into and compressed in the cavity before it sets or consolidates. It should then be covered and kept dry from ten to thirty minutes. Those who have used a good article recognize in it a very different thing from what has been from time to time imposed on the dentists as “a prime article, etc.,” and find it useful in certain cases from its color, its non-conductive power, and its sanitary effect on the condition of the tooth, occasioned possibly by the action of the chlorine in the preparation, on the dentine permeated by the destructive power.

PLASTIC FILLINGS OR FILLINGS SOFTENED BY HEAT.—The last fillings I shall mention are the plastic fillings. One made of gutta-percha, combined with oxide of zinc or tin and ground silex, is sold under the name of “artificial dentine.” It is generally used as a temporary filling, but under proper manipulation and in *proper place* will, in many cases, last for years. This filling is warmed carefully and inserted in the tooth, and

compressed. The pieces can readily be united by heat, and instruments more or less serrated for its use are important. This filling should be conscientiously and solidly packed in every part in order to produce permanence.

The plastic filling of Dr. Wood, under the name of "Wood's Plastic Filling," is placed in the tooth with little heated instruments resembling small soldering irons. Some dexterity and practice are necessary to use the material readily, and it is claimed by Dr. Wood that it is a better compound than any of the mercurial amalgams. It is heated at such a low degree that it is claimed there is practically no shrinkage in the tooth. I have not verified this as yet by experiment.

There are certainly in all these fillings variety and modes of practice enough to produce some confusion without special care on the part of the lecturer to define his own mode. Enough among the fillings of gold to which I particularly refer.

To recapitulate.—*First.* A gold filling depending on the pieces of gold wedging against the sides of the cavity, partially condensed, finished by condensation of the whole filling by hard pressure.

Second. The same, with the pieces condensed separately to their utmost.

Third. An adherent gold filling packed with serrated instruments, the pieces forming one mass.

Fourth. A gold filling compounded of adhesive and non-adhesive gold.

Fifth. A filling of amalgam that hardens independent of moisture—as those of silver, and tin and silver, tin and platina.

Sixth. A filling that requires to be kept dry after packing, as the oxy-chloride.

Seventh. A filling to be warmed before being packed in the cavity—as the plastics.

Eighth. A filling to be warmed, the specific gravity of which is such that it needs no condensation, as Wood's filling, but requiring special instruments.

Ninth. Radically different modes of filling teeth.

Superficially thinking, few, even among dentists, would say that so many styles and such a variety of materials were at hand at their beck and call. My object in calling your attention to them this evening, is to define them. The subject, however, suggests the idea that we all should become intimately acquainted with these different modes of inserting fillings, for I claim that each and every one of these fillings *may* be used to advantage under some circumstances.

In calling your attention to these different ways, I also call it to the very varied means at your disposal for saving the natural teeth from de-

struction, and the necessity of being able to use each in its proper place.

If one is curious also to know the number of metals used in some form, we can name seven, at least: Gold, platina, silver, tin, zinc, cadmium, and mercury. And if we add to these different ways of filling, a knowledge of the different forms of the materials used which some operators deem so essential to perfect work, such as folds, coils, pellets, and strips, and a knowledge of all the different instruments used with their various turns and angles, that others deem essential to ease of operation, we find we have much to learn, especially the younger members, before we can graduate in the highest class of dental surgery, having learned to use all materials well, all modes, and become acquainted with the best and most approved working instruments, including a knowledge of the power of the mallet.

Mr. President and Fellow-Members, I do not know that this essay will afford you even a glimmer of light, but as an entering wedge that others may strike upon, to open this subject farther, I present it. Should it meet your favor, I may at some future time continue the same subject, with reference to the particular conditions under which, in my estimation, each style of filling may be used to most advantage.

The work is before us. To those whose fortune it has been to point to the seal on a diploma as an emblem of what they have achieved, and to those who have not made that grand starting-point, let me say that ours is a practical profession. Despising not theoretical knowledge, let us graduate so high, both in theory and practice, that when the call comes, *as it will come*, for one to fill the Professor's chair of Dentistry, foreshadowed in our president's late address, it shall be universally acknowledged that in our midst are men abundantly able to fill it with honor to themselves, and to the profession, to which they have given their best thoughts and the choicest hours of their lives.

BOSTON, November, 1865.

DENTAL MATERIALS.

BY J. CARROLL HOUSE, D.D.S., LOWVILLE, N. Y.

HAVING been a somewhat careful student of most, if not all, of the standard works of our profession or collateral to it, as well as the periodical issues of our professional press for many years, I have been led to wonder that so little, if anything, is said therein relative to many of the materials upon which the dentist is wont to exercise his skill directly, or makes indirect use of in a multitude of his manipulations. As I had noticed this, to me apparent deficiency in our literature, I had hoped, particularly for a year or two past, that some better prepared and more

able writer than he who pens these lines aspires to be, would be moved to the work of supplying the want. But I have thus far looked in vain, and thinking that a series of comprehensive articles (so far as the limits of a periodical may permit), in which the histiology, chemistry, and mechanical and artistic uses of the several substances alluded to should constitute the matter of the communications, might find some willing readers—if only among the novitiates of our profession—I herewith send my introductory article, which I hope if agreeable, to follow as my time may permit, with others of a similar cast; simply premising further, that I shall avail myself of any assistance at my disposal without at all times stating my authorities or stopping to give credit. Such references might give more weight to my articles, but would unduly increase their length without proportionately increasing their value to the reader.

No. 1.—GYPSUM.

CHEMISTRY.—Gypsum is found occurring in several natural developments, always resolving itself into one of two chemical formulæ, and known technically as the hydrate and the anhydrate. The former composed of lime (oxide of calcium), sulphuric acid, and water, and represented by the formula of parts, viz.:

Lime	(CaO)	32·56
Sulphuric acid	(SO ₃)	46·51
Water	(HO)	20·93 = 100·00

With the representative combined formula $\text{CaO}, \text{SO}_3 + \text{HO}$

The variety styled the anhydrate is composed of

Lime	(CaO)	41·2
Sulphuric acid	(SO ₃)	58·8 = 100·00

The former is by far the more common character of gypsum. The latter only occurring in one or two localities in any extent, and then resolving itself into the *hydrate* by absorbing the requisite amount of moisture (HO) on exposure to the atmosphere for any considerable length of time. Varieties of gypsum have been found in Southern Virginia and at Pictou, in Nova Scotia, which contain only half an equivalent of water of the formula $2(\text{CaO}, \text{SO}_3) + \text{HO}$.

Sulphate of lime is formed by the action of sulphuric acid upon any of the *carbonates* of that substance, such as chalk, marble, limestone, etc., the carbonic acid being eliminated, and the sulphuric acid uniting with the lime as a base.

Iron pyrites, which is a mineral sulphuret of that metal, often produces gypsum when brought in contact with the carbonates of lime, and subject to a certain train of circumstances conducive to the proper chemical changes for producing that effect; the sulphur of the pyrites, being disen-

gaged from its combination with the iron, unites with the proper amount of oxygen of the air to form the acid, which then joins the lime, driving off the carbonic acid, leaving the iron either as a metallic oxide or combined with some other constituent to which it may hold a chemical affinity.

Under a moderate heat, hydrous gypsum parts with its water of crystallization, becomes opaque and falls into a white powder; but will not fuse without the addition of some proper flux; although one variety of gypsum, *selenite*, is partially vitrified under the common blow-pipe in the reducing flame. Under the powerful flame of the oxyhydrogen blow-pipe or the electric flame, gypsum loses a part of its sul. acid and fuses into a white glass, which, soon after the heat is removed, deliquesces slightly, and falls into an impalpable powder, like air-slaked lime.

When native gypsum, from which the water of crystallization has been expelled, has been mixed with water, it absorbs precisely the same amount that has been driven off, and, by a species of recrystallization, solidifies into a compact amorphous mass, though occupying more space than in its original form after calcination.

Gypsum is but slightly soluble in water, being but about one part in 500, is not readily acted upon by many of the acids; yet is soluble in chlorohydric acid without effervescence (a fact of direct importance to the dental profession, as by the use of the latter acid displayed in the form of a mild pickle, in which the plates of vulcanite are thrown for a few hours, the dentist is enabled to easily and thoroughly cleanse the same from every particle of adhering plaster). Some specimens of seawater are found to contain slight traces of sulphate of lime. "It is not unfrequently found united with carbonate of lime in sufficient proportions to create a brisk effervescence with nitric acid."—(*Rees.*)

Powdered uncalcined gypsum will become solid when mixed with a solution of potash, or the various salts of potash, effervescence taking place when the carbonate is used, and this salt is converted into the sulphate. No effect is produced with the chlorate or nitrate, nor with any salts of soda. But the double *tartrate of soda and potash* (Rochelle salt) acts instantaneously, the formation of a bibasic salt being the resultant.

GEOLOGY.—Gypsum is often met with in various rock formations. It occurs among the tertiary strata of the London and Paris basins; is found in extensive beds in the secondary rock of North America, especially the lower carboniferous of Nova Scotia and the Devonian of New York and Virginia, associated with rock salt, saliferous marls, clays, and limestone. According to Prof. Blake, Geologist of the Pacific Railroad Survey, there were deposits of gypsum of considerable extent discovered at various points along the different lines of that survey. Those of the largest extent, in that great Sahara of America, the "Llano Estacado"

(or Staked Plain), where large beds of it are found. These deposits are referred by Mr. Marcou to the English Triassic group, with which he also classes the red sandstone and gypseous formations of New Jersey, Windsor, N. S., Plaister Cove, and Prince Edward's Isle. Yet Mr. Dauson states, in his *Acadian Geology*, that the gypsum of Windsor and Plaister Cove has been shown to belong to carboniferous groups, being decidedly indicated by and associated with the characteristic fossils of that deposit. In Virginia and Iowa, gypsum is found in the carboniferous formations: Along the banks of the Des Moines River, in the latter State, according to Dr. Owen, the stratum of gypsum is twenty-five feet thick, resting upon pink shales. In the western part of New York, immense beds are found traceable for miles, and are often eighteen or twenty feet in thickness. "Between Auburn and Syracuse, from 40,000 to 50,000 tons were removed in the excavations for the railroad."

It may not be unprofitable to glance for a moment at some of the theories of naturalists, by which the various deposits of gypsum are accounted for and their formation explained. Their *igneous* origin was at one time partially received. The absence of all stratification in some beds, being regarded as evidence of their once being in a melted or fluid condition, and their intrusion between the strata, as volcanic rocks or lavas are found to traverse stratified deposits. Some attribute the formations of the beds to a purely *mechanical* origin, as having been deposited at the same time with the adjoining strata and in a similar manner. But the *chemical* theory is the one most generally received at the present day, being indorsed by Drs. Hitchcock and Owens, Professors Blake, Dana, Dauson, and others, and is briefly stated thus: "The formations are created by the percolation, through the strata, of water charged with free sulphuric acid, or with sulphate of iron derived from the decomposition of pyrites (native sulphuret). When such a mixture of acid and water passing downward through the strata comes in contact with *carbonate* of lime, either disseminated in the strata or in the form of beds, it produces decomposition, and the sulphate of lime which is formed crystallizes either at the place of formation or at a still lower point where the gypseous solution accumulates. When the infiltrating fluid is charged with sulphate of iron, a double decomposition takes place, sulphate of lime and carbonate or oxide of iron are the resultants; the latter being deposited at the point of decomposition as a red or brown powder. The occurrence of the *red marls* and *sandstones* are thus to be explained."—*(Blake.)*

With regard to the presence of sulphuric acid in sufficient proportions for such grand results as are manifest in the great laboratory of the Divine Architect, we may say that it is not unusual, even at the present day, to find sulphurous eliminations in close proximity to such formations. Such are sulphur springs, which emit sulphuretted hydrogen, or retain it in

solution, which on coming in contact with the air is converted into an acid by the absorption of oxygen. And it is not impossible that *free* sulphuric acid may have flown directly from some such sources in former ages in sufficient quantities to meet all the requirements of the case. Certain it is, that modern volcanoes frequently give out rivers of waters intensely charged with sulphurous and sulphuric acids; and it is well known to the physical geographist, that there is in the Isle of Java a lake of sulphuric acid, from which flows a stream as devoid as is the Dead Sea itself of animal life. Now the water of such a stream, surcharged with acid as it is, on reaching the sea, being of far greater specific gravity, would flow along the bed of the same, and if it came in contact with any of the lime carbonates, a decomposition would ensue, and gypsum would be the resultant. Again, we find that when entombed organic remains undergo decomposition, one of the principal eliminations is sulphuretted hydrogen; and we thus have still another basis from which, by chemical combinations, sulphuric acid may be readily formed, and in considerable quantities, in the great laboratory of nature.

MINERALOGY.—When gypsum crystallizes, we find it in the monoclinic system, with crystals lenticular and lance-shaped, also in right oblique prisms, often beautifully transparent, most of which may be cleaved or split in one direction into thin transparent plates like mica, though not elastic. Crystallized gypsum is softer than rock salt, may be scratched with the thumb nail, is 15 to 20 of the mineralogical scale of hardness, with a specific gravity of $2\frac{5}{10}$, or rather less than the carbonates of lime.

Gypsum is found under many and various forms of deposit, in small and perfect crystals, in broad thin plates like glass, in fibrous masses with a lustre like silk, and in granular heterogeneous opaque or translucent masses, with varying degrees of fineness of grain and receiving a variety of names. The translucent or semi-transparent varieties are called **SELENITE** (from *selene*, moon). The fibrous masses are known as *satinspar*. Under the general name of **ALABASTER** (*albus*, white) are gathered the fine-grained amorphous varieties, which, when colored in bands, is termed *onyx* alabaster, or when clouded, *agate* alabaster.

Captain Pope, of the Pacific Railroad Survey, deposited with Prof. Blake a curious specimen, which is thus described: "The specimen, No. 14, is deserving of more than a *place* in the catalogue. The specimen is about five inches long by two thick, and was taken from the banks of the Delaware Creek. It at first appears to be a stratified mass, being marked with regular lines like the divisions between strata. The main portion of the mass is white, opaque, and amorphous gypsum, but it is in combination with transparent selenite; the white amorphous portions are in thin and partial layers about one-tenth of an inch thick, and they are separated by thin sheets of a different color and about as thick as a stout card. An

examination of these latter shows them to be *carbonate of lime*. This result is very curious and interesting, and the formation (geologic) of the mass is not easily explained. * * * * The transparent selenite which traverses the mass, cuts obliquely across the opaque layers both of the gypsum and carbonate, cutting them off like a dike traversing stratified rocks. Some of the layers of carbonate are, however, found in the mass of the selenite, preserving their parallelism and general character, but not exactly parallel with the outer layers. The principal cleavage of the selenite is oblique to the layers, being inclined at an angle of 45° . * * * * Any hypothesis which will explain all of these phenomena is not easily found." The professor gives several, but says: "It appears more probable that the whole mass is due to a segregating or crystallizing force acting while the solution of lime was diffused in the strata of earth or sand, and bringing the particles together in one seam, as water during its crystallization is sometimes separated into layers from a bank of earth or clay."

Besides those varieties which I have mentioned above, there is still one other comprising all those coarser and impure deposits which are not included under any of these varieties, and to which more properly belong the great bulk of the gypseous formations.

There are almost an endless variety of colors to be met with in the mineral gypsum: blue, ochre, and honey yellow, flesh color, pink, and deep red, gray, etc.; but the prevailing pure varieties are white, the *colors* rather indicating the presence of foreign substances.

SCIENTIFIC, MECHANICAL, AND ARTISTIC USES.—Some of the varieties of gypsum have been known for centuries. We are told by Pliny, that among the curiosities of the ancients in the first century, was a novel kind of bee-hive made from plates of selenite, to enable the curious to observe the bees at their work; and Nero also in the same century, when he was erecting his "Golden Palace" in the City of Rome, after the great conflagration of 64, made use of the mineral, under the name Phengites, in the windows of his palace, because it possessed the power of permitting "those within the house to see all that passes abroad, while those without cannot behold things which go on within." Among the ancient ruins of the Aztec tribe in Northern Mexico, evidences are to be found that plates of selenite were used by them to admit light to their dwellings, while it excluded the storm; and, indeed, at the present day travelers state that in many cities and villages of New Mexico, this mineral may be seen in their windows; and that under the name of "Yeso," it is a commodity of commerce among the natives, who obtain large quantities of the mineral from the plain *Llano Estacado*, and transport it even as far as to Zuni, to be used for the above purposes, where the thin laminae are much prized as a substitute for glass, being nearly as transparent and far cheaper than window glass.

The very extensive use of the finer qualities of the white amorphous variety, in the various artistic and fanciful forms of statuettes, vases, ornamental boxes, caskets, perfume bottles and a thousand other ways which I here may only hint at, under the name "alabaster," is well known to almost every one. These articles of *vertu* are to be found in their greatest perfection in the hands of Florentine artists, who have a world-wide celebrity for their taste and skill in the ornamentation of alabaster. Their material is obtained mainly from a mine near Castellina, in Tuscany, where the mineral is found in the form of nodules or spherical masses, varying in weight from twenty to upwards of two thousand pounds, and disposed at irregular distances in the gray gypseous formations, from which they are isolated by thin brownish crusts. Crystals of beautiful transparent selenite, and often of large size, are sometimes found in the fissures of the gypsum. These are used for making the celebrated Scagliola cement, and are held at a high value. Alabaster is worth at the mines 5 lire (about 77 cents) per hundred pounds, or 8 lire (\$1.25) at Leghorn.

The fineness of grain, uniformity of texture, susceptibility of polish, and its translucency, are the characteristics sought in gypseous alabaster for the artist's chisel. The best varieties contain more or less carbonate of lime. That which most nearly resembles Carrara marble is sought for by sculptors; specimens of the latter are often found which can only be distinguished from the marble by its lower scale of hardness. Alabaster is worked very much after the same manner as marble, though of course more easily, and can be wrought in the lathe with great facility; the tools being sharpened to about the same angle as for turning brass or ivory. Objects which cannot be wrought in the lathe are executed with the knife, rasp, or file, while fine chisels and gravers are used for the more delicate parts. For polishing, the artist uses fine bolted pumice, following this with dried shave-grass and water, finishing with a pulp-like mixture of chalk, soap, and milk, or a putty formed with fine sifted slaked lime and soft water; the final polish or satin lustre is imparted by friction with soap, water, and lime, and then with powdered and elutriated talc; ending with flannel. Articles consisting of many parts are cemented together with air-slaked lime and albumen (white of egg).

"Alabaster ornaments are liable to a yellowish discoloration by exposure to the atmosphere, and are especially injured by smoke and dust, and, therefore, delicate or choice pieces have to be protected by glass shades. When tarnished they may be partially restored by washing with soapsuds, and then using clear water, and again polished with shave-grass. Grease spots may be removed by rubbing with talc powder, or the oil of turpentine or benzine. Alabaster may be stained with metallic solutions, tinctures of dyeing plants in proof spirits, or with colored oils, in the same way as marble."—(*Ure.*)

(To be continued.)

ARTIFICIAL CROWNS.

BY I. J. WETHERBEE, D.D.S.

An Essay read before the Massachusetts Dental Society.

MUCH has been said and written in favor of and against the practicability of inserting *crowns upon the roots of teeth*. The varying success of the two classes of operators must be the reason for this great diversity of opinion; since no well-founded objection can be offered against this style or kind of practice, provided the operation is well performed.

I believe that in no branch of our honorable profession is there so little care exercised, or pains taken to perfect the operation undertaken by many practitioners, as "*engrafting crowns upon the roots of teeth*." I further believe, that this is due to a misapprehension of the durability of the roots of teeth.

There is a distinguishable difference in the character and quality of teeth; and this difference holds good with reference to the roots. Therefore, some will last much longer than others, where like perfection in the operation obtains. But few are so poor constitutionally as to make extraction advisable for the substitution of a plate.

It is urged by many that the liability to *periostitis* and the formation of alveolar abscesses is an objection sufficiently weighty to dissuade them from this mode of practice. While I admit that *periostitis* may supervene, I hold that it is a small objection, rightly considered, and unworthy the confidence of a skillful practitioner.

Some go so far as to assert that as soon as the *pulp* has lost its vitality, it becomes a foreign body and should be immediately removed. To all such I have to say, "I doubt the correctness of their philosophy," and must therefore reject their conclusions. Why should the results following imperfect operations be set forth as a reason why more perfect operations with good results should not be performed?

To every student in dentistry such reasoning is simply fallacious, for observation and experience have taught him that in preserving the status of nature, we subserve to the greatest possible extent the interests and comfort of our patients.

Another objection is often urged, viz., that patients will not pay the fee requisite for a first-class operation. Do not such practitioners deceive themselves? For it is patent to every one that a gold plate, with one or more teeth mounted and properly constructed, costs the patient more money than the engrafting of a crown very thoroughly upon the root.

Again, the trouble and inconvenience in wearing the best adapted plate are far greater than are the difficulties in retaining a well inserted crown, leaving out the fact of the want of a perfect naturalness in appearance.

The first thing to be done is the excision or cutting off the crown, which requires great care, so as not to jar or strain the root in its socket, which, if done, is an exciting cause of periostitis. The best way of doing this is first to file transversely near the margin of the gum on the labial and palatine surfaces in order to secure a positive retention of the position of the forceps, as also to prevent splitting, or in any other way doing violence to the root.

The forceps should be straight on their cutting surface, and sharp, but not too wide. By gentle pressure the tooth will be separated above the termination of the pulp in the crown; leaving a small orifice for the introduction of *gold broché* with a cutting lip at the end, which should be thrust to the apical foramen, and rotated until the sensibility of the pulp is destroyed.

I then proceed to enlarge the orifice sufficiently to admit of the extirpation of the pulp with little or no pain. The next step in the operation is the formation of the face of the root for the reception of the crown. I use first a large cutting instrument in reducing the surface. Next a still larger drill with a centre made especially for this purpose; after which I finish with the ordinary oval file.

Having completed the operation on the face of the root, I proceed to fill the pulp cavity (or so much of it as is not taken up by the pivot) with gold as thoroughly as possible. The root is then drilled to the depth and size required, when a crown is selected and fitted perfectly. Here I think many fail to do justice either to themselves or their patients. I have often found pivot teeth inserted by practitioners, which were either too full on the labial or too deep on the palatal surface, or not closely fitted so as to exclude the deposition of sediment between the crown and the root, either of which are fatal to the comfort of the patient and the durability of the root.

The pivot is then to be made of wood, it should be compressed as much as possible by passing it through several holes made in ivory or bone, the last to be somewhat smaller than the orifice in the root to allow of easy adjustment, as also to close the pores of the wood which prevents free absorption of moisture.

In connection with the above, I will mention two cases which have come under my observation during a practice of twenty years. The first were two *central incisors*, which had been in use twenty-eight years. Several resettings had taken place during that period. For the greater part of the time they had been perfectly comfortable as well as useful. The second case was the left *central incisor*, which had been worn for eighteen years with great satisfaction. The teeth were of good quality; hence the durability of the roots. If teeth are perfectly inserted with pivots made of wood, there is very little probability of trouble.

The repeated failure of unskillful operations in the use of pivots made

of wood, is no argument against their practicability in very many cases where the patient is unable to pay for a better or first-class operation.

I will now pass to a consideration of a better method of inserting crowns upon the roots of teeth which I consider quite as perfect as it is original with myself. The preparation of the root has already been described, also the crown; provided it be a common pivot tooth, I form a pivot of unannealed gold wire of proper size and length, cutting a screw one-third of the length entering the root. I then use compressed hickory wood the requisite depth, into which the pivot is inserted firmly.

The end which enters the crown is provided with a dovetailed slot, which is filled with wood so as to retain the crown in its position. The pivot is then carried to its position in the root; then I proceed to plug the space which remains (being two-thirds of the depth of the pivot) with gold, which preserves the root for twice the length of time of wooden pivots, and at the same time is far more comfortable and satisfactory.

The next step is to prepare my cylinder made of wood, which I insert in the orifice of the crown, when it is placed in position and the work is done. For the comfort and durability secured by this process, a patient can well afford to pay a reasonable fee.

I have still another method which is preferable, against which no possible objection can arise. I so construct the crown by a combination of gold with porcelain, that wood is excluded from contact with the saliva. The tooth is made with a groove in the centre of its posterior surface, with two platina pins on either side for the purpose of receiving a gold backing and cylinder, to be soldered and finished to represent the ordinary form of pivot teeth. The cylinder may be round or square. The square cylinder is the firmest, and may therefore be more frequently chosen, especially if the root be of good size. The insertion of the gold pivot in the root has been already described, and need not therefore be enlarged upon.

The durability of this style of work, and the comfort it affords the patient are perfectly satisfactory. I have cases which have been in wear for ten, twelve, and seventeen years, which have never given the patient an hour of trouble, and as yet give no signs of weakness or decay. I am of the opinion, that the last described method embraces all that human ingenuity can do in giving back, or restoring to nature her lost crown.

I frankly admit that it is an expensive operation; therefore, many will adopt a less expensive mode. Every practitioner should thoroughly educate himself in order that he may do for his patients the best thing without reference to cost. Whenever the ability of the patient shall justify its adoption, he is not at a loss how to do his patient ample justice.

RESULTS OF TREATMENT OF ALVEOLAR ABSCESS.

BY HENRY S. CHASE, M.D., D.D.S., IOWA CITY, IA.

NUMBER of cases treated in the last eight months, 18—males, 6; females, 12. Ages—7, 15, 18, 22, 23, 23, 24, 25, 27, 30, 31, 31, 32, 35, 35, 35, 40, 40.

Age of abscess in months—24, 11, 24, 12, 72, 48, 36, $\frac{1}{2}$, 12, 48, 18, 36, $\frac{1}{4}$, 60, 96, 36, 60.

Creosote was the only injection used. It appeared at the external opening of the abscess in 17 cases.

Injection used once in.....	12 cases.
“ “ twice in.....	2 “
“ “ thrice in.....	3 “
Suppurated after first injection in.....	8 “
“ “ second injection in.....	2 “
Cured by the first injection.....	8 “
“ in one week.....	10 “
“ in four weeks.....	4 “
“ in three “	1 case.
“ in eight “	1 “
Not cured at all.....	1 “

This was the left under second molar; had discharged three years. Injection failed to show externally.

The class of teeth as follows: Upper jaw—third molar, second molar, fifth bicuspid, second canine, and fifth incisor; under jaw—first molar 2, and second molar 2.

Every case was treated through the pulp cavity. I use no syringe in injecting the creosote. After thoroughly protecting the mouth by pieces of spunk, I fill the pulp cavity with creosote and a loose pledget of cotton. I then take a piece of soft rubber and place behind, and, with a plugger, force the creosote through the roots. It occasionally takes half an hour to work it through. I have sometimes failed at the first sitting, and succeeded at the second. I suppose that the foramina of the roots are sometimes closed with the dead tissues, and a previous soaking with creosote opens the way for a second injection.

When the creosote passes through the roots, there is a warm sensation in the alveolus; when there is considerable resistance to the passage of the injection, there is apt to be much pain felt at the end of the root.

And here, perhaps, it may not be out of place to warn the inexperienced that creosote should never be forced *through* a root where there is no outlet through the gum. If you should drill through the end of an incisor root, for instance, and should then force creosote through into the

alveolus, you would be likely to have extensive inflammation of the parts. This sometimes happens to those who fail in diagnosis, as I did myself, not long ago, as illustrated in the following case:

Mr. — wished a pivot tooth on the right upper canine root. Noticing a fistulous tumor between the canine and first bicuspid, I was informed that it often discharged pus. The patient and myself thought it proceeded from the canine. The adjoining bicuspid was plugged, however, but was not sore to pressure, and the canine *was*. With a very fine drill I opened the foramen of the canine's root, and forced through creosote. None appeared externally, to my surprise. Dismissed my patient for one week. He returned next day with erysipelatous inflammation of the whole right side of the face; canine root very sore to touch; gums much swollen; to take mercurius vivus until better; in a week patient called again; face well; fistula has discharged pus since last visit; concluded the abscess was connected with root of first bicuspid; removed plug and found pulp cavity exposed; contents had been destroyed, but not removed; opened cavity thoroughly, syringed with tepid water, and forced creosote *through* so as to show externally. This proved my first diagnosis incorrect.

By syringing the cavities with water, much is retained, and affords a vehicle for the creosote, and is caustic enough when thus reduced. I think there is danger of *over-medication*. I never use creosote but once, unless suppuration follows. After the injection, I plug with Hill's stopping for a *trial* plug; this remains from three to six months before plugging with gold.

HARD RUBBER.

BY R. M'KISSICK, D.D.S., PENNINGTONVILLE, PA.

ONE of the greatest objections to the use of "Hard Rubber" for partial sets, where one or more teeth are required, and particularly where the gum is prominent—not allowing the rubber to pass over the alveolar ridge, making it necessary to use plain teeth, fitting them against the gum—is, that it does not possess strength requisite for such cases. But I might say that the fault does not lie in rubber, for it rarely gives way; it is the teeth that break off, there being too much stress upon the pins when depending upon them alone for support.

The method which I have adopted obviates the difficulty in such cases as above referred to. I use plate teeth, fit them to the case the same as if they were to be soldered to a metallic plate, back with gold or platina, as silver does not answer; the sulphur combining with it destroys its ductility to a great extent. After removing from the cast, lay them upon a piece of paper, with the backing down, and cover with a mixture of plas-

ter and sand; then upon the backing of each tooth solder a staple, allowing a space of about an eighth of an inch between the staple and the backing. The backing strengthens the tooth very much, and the rubber passing through each staple makes them secure, and not so liable to break as when put on in the ordinary way.

PROCEEDINGS OF DENTAL SOCIETIES.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED BY THOMAS C. STELLWAGEN, D.D.S., A.M.

A MONTHLY meeting of the ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA was held Tuesday evening, December 5th, 1865, Dr. C. A. Kingsbury in the chair.

Dr. S. R. Screven presented some specimens of platina pins for artificial teeth, and said:

Improved fastenings for artificial teeth, consisting of a double head, one to be imbedded in the rubber and the other in the tooth, have been sought for ever since the introduction of the vulcanite base for dental purposes. This has at last been reached in an indisputable manner, as the naked eye, *without the use of a microscope*, can readily detect *both heads*.

The improvement I claim to have made will suggest its own advantages. I will therefore merely give a description of its form, etc. Sheet platina is used instead of wire, and a pair of punch-forceps to form the fastenings, instead of the complicated pin-machines now used for cutting wire.

The fastenings consist of two flanges and a connecting-stem, so as to form the letter T, the smaller to be inserted and burnt in the tooth in the ordinary manner; the larger flange forms the head to be imbedded in the rubber. The size of the head may be varied to suit the manufacturer. If desirable, the outer flanges can be formed so as to joint or but against each other, forming a continuous rib of platina, imbedded in the rubber, around the entire set of teeth when mounted.

Experiments have shown that well-formed platina T-fastenings may be used to great advantage, one of which is, that twenty-five per cent. of platina can be saved, including all waste or cost of reducing scraps to plate again.

The punch-forceps used to form the rivet are so arranged, that a T of any size can be punched out with the same instrument.

Dr. McQuillen read a letter from Prof. Richard Owen, F.L.S., acknowledging the receipt of the notice of his election as an honorary member of

the Society; also the following extract, from a private letter, which he had recently received from Mr. John Tomes, F.R.S., of London:

"As a reader of the American publications, I have wondered to see so little noticed of an operation which is now becoming common in England—the twisting of teeth in their sockets then and there with a pair of forceps for the purpose of correcting irregularity of position. It is an operation I have frequently performed in children up to the age even of thirteen, sometimes operating upon two teeth on the same occasion; and, up to the present time, I have not lost a tooth. Although of course loosened in the socket, within nine days they become firmly fixed in their new position, thus saving the tedious treatment which the wearing of a plate involves.

"We have just now produced, as I think, in an imperfect form, an instrument for drilling out by drills, burs, emery-wheels, etc. the diseased parts of the teeth. The cutters are mounted upon a shaft put in motion by a strong clock-spring. The inventor is Mr. Harrington. I have had one in use for several weeks, and find that it would, with certain adaptations, be very useful for grinding and polishing the surfaces of fillings in any position where a rapidly revolving minute-wheel can be brought to bear. For the purpose of cutting out caries for the formation of a cavity, I fear the instrument is useless; but for rendering the edges of a cavity where the diseased tissue has been removed, smooth or even polished, it is effective."

Dr. J. E. Garretson said, speaking from a surgical stand-point, that the operation was not one to be recommended. Nature, however, not unfrequently allows strange liberties; and if Mr. Tomes finds that she permits such an one as this, his respect for that gentleman's experience commended the matter as being well worthy the consideration of the Society. Men unlearned in anatomy and physiology frequently accomplish anomalous things, but their asserted success gives little weight—and properly so—to their recommendations, and for the reason that their operations, not being scientifically grounded, may have, as the basis of the success, a happy run of accidental relations. With the recommendations of Mr. Tomes, we are, however, to deal differently: here is learning unsurpassed, certainly so in so far as osteological researches are concerned, and with the learning are judgment and experience.

Viewing the operation, as in this moment first hearing of it, there seemed many objections to be offered. Temperament would appear to contraindicate it in many cases; anatomical peculiarities in the fangs of the teeth would also, in other instances, present obstacles insurmountably adverse to the performance. It would also seem to be true that the internal vitality of such twisted teeth would be very much risked. Besides these objections, it appeared to be an unnecessarily severe operation—one which American patients would scarcely care about being subjected

to; still, these various objections may be more imaginary than real. Mr. Tomes' experience seems to say that they are; and, as he had already remarked, for Mr. Tomes and his opinions he had great respect. As far as his own practice in this direction was concerned, he would prefer to wait until some less conservative person on this side of the water tries it on some of his patients, as he finds it desirable, as a rule, to be

"Not the first by whom the new is tried,
Nor yet the last to lay the old aside."

Dr. McQuillen had no experience of his own to offer on the subject, and although strong objections might be urged against such a practice by many, he felt indisposed to take exceptions to this plan of operating in cases of irregularity merely from a theoretical stand-point, particularly when such a careful and accurate observer as Mr. Tomes states that he has tried it a number of times without losing a case. Viewing the subject physiologically, it did not seem at all improbable to him, when taking into consideration what the human organism will bear, that the tooth of a young person could be rotated with forceps in its socket without detriment to the future well-being of the organ. The pain attendant upon the operation could be relieved by the use of anæsthetics, and the subsequent soreness of the parts by the employment of antiphlogistics and palliatives. As an illustration of what can be done with the dental organs, those present were well aware of the fact that John Hunter extracted a tooth, and placed it, while still fresh, in an open wound in the comb of a cock, where it became firmly united.

The extraction of a sound tooth which sometimes occurs by mistake, and the subsequent union of the parts after its replacement, not to speak of cases of *transplantation* of teeth from the jaws of one person to those of another, indicated what had been done, and with favorable results.

Again, it might not be amiss, in connection with this matter, to refer to the success which has attended the efforts of an experimental physiologist in grafting parts of animals on to the body of others; the tail of a rat, for instance, on being transferred to the side of another animal, becoming not only united, but the tail of the young rat actually *increasing in length*. Physiological data such as these demonstrated what the powers of the animal economy were capable of effecting. The possibility of destroying the vitality of the pulp was the principal objection to the practice advocated: the liability, however, was greatly lessened in young persons where the foramina at the apices of the roots of the teeth are large. Under favorable circumstances, and where cases warranted the operation, he should feel inclined to try the plan.

Dr. Tees spoke of the danger of irritating the alveolar dental membrane and severing the delicate blood-vessels and nerve filaments, causing death of the pulp, alveolar abscess following, and finally the loss of the

teeth. Mr. Tomes does not mention the date of the commencement of this practice. If but recent, these cases may ultimately prove unsuccessful, since two or more years ought to elapse before success should be counted upon as a certainty; the teeth might present for that length of time the appearance of life and health, and yet contain devitalized pulp.

Dr. Breen had had some little experience. Having been requested by the parent of a little girl, between seven and eight years old, to correct an irregularity of the right superior central incisor which stood out of the circle at the mesial surface one-eighth of an inch, he selected an old smooth pair of forceps, and, without any guide but his own judgment, embraced the tooth within the instrument, and, with a slight rotary movement once a day for two weeks, obtained the desired result. For fear of irritation of the parts, he ordered a wash to be used of tannin and myrrh diluted with water. He saw the patient three years after, and the irregularity was corrected.

Dr. Ellis felt satisfied that to a novice this method of practice would present an inviting and practical aspect—*inviting*, since it obviates the tediousness ordinarily entailed, the suffering and inconvenience (so often unnecessarily) inflicted upon the patient, and the trouble and annoyance accompanying the construction, reconstruction, adjustment, and readjustment of the various appliances employed in the practice of orthodontia: *practical*, since he would feel convinced upon slight reflection that the application of sufficient force must result in the speedy and perfect alignment of a tooth of facial malpresentation. But to our minds, as practitioners of more or less experience, such suggestion does not present in the light of a "novelty" (although it seems, from the tenor of the communication read, to be so viewed in London), because those of the members who, like himself, had never tried it, were able to adduce as an excuse the apprehension engendered by a knowledge that it was long since tested, condemned, and abandoned.

He wished it understood that he could not from experience pronounce either in its favor or disfavor; but from the weight of the past testimony, and the apparent anatomical and physiological incompatibilities, he harbored a strong prejudice against its performance.

If the root of an oral tooth approximated very closely to a perfect, vertical cone, he could conceive that success would likely attend the operation of torsion; but there is rarely observed such symmetrical development, and the prevalence of that peculiar deflection of the terminal portion of a root from the mesial line, would necessitate the transit of a considerable arc and consequent rupture of the apical vessels and nerve.

There are other dangers incurred, viz., the risk of fracture, chronic periosteal trouble, exostosis, and even exfoliation of the alveolar borders. He was cognizant of the latter result having attended the forcible and in-

stantaneous separation of teeth prior to filling, now so much in vogue with certain practitioners, and felt sure that, under the equal or even greater violence of torsion, such a result might be apprehended.

He deemed it absolutely essential that two years should elapse, from the time of the operation, before testimony in its favor be allowed to carry a tithe of conviction, and even then he would favor an extension of the probationary period to three or four years. In other words, he would cautiously experiment and patiently await those evidences of devitalized pulp often so tardily manifested.

Dr. Flagg believed "discretion the better part of valor," and therefore while he admitted the practice of "forcible torsion" to be valorous, and while he believed in its possible efficacy, he could not view it as in any manner discreet or advisable, for he regarded it as so old-fashioned as to have become obsolete; not that things were valueless from the fact of their antiquity, but the "modern" practice might certainly be viewed as improving and progressive, or else all recent labors must be stigmatized as wasted energy. The practices of "transplanting" and "forcible torsion" were among the accomplishments of dental practitioners of fifty years ago, and were then justly regarded as the "best methods;" since which S springs, V troughs, etc. upon plates had had their day, and in turn were fast becoming obsolete. He wished to assert his full appreciation of Mr. Tomes' well-earned claims to marked consideration in connection with the literature and practice of dentistry, but he must regard the hinted superiority of "forcible torsion" over the use of plates, as indicative of a restriction to this choice which evinced a want of familiarity with the application of the simple but efficacious combination of ligatures and rubber tubing which constituted the present method of correcting such irregularities as were under discussion. He objected to the violence done the parts when forcible torsion was resorted to, recognizing the impossibility of its performance without the concomitant of much suffering; while in the judicious use of ligatures, etc. the results were prompt, gratifying, and comparatively painless. He could speak from quite extended personal experience in this matter, for he had corrected, during the past fifteen or eighteen years, some fifty cases in which torsion was indicated as a part or the whole of the operation. The whole appliance for the turning of one or two teeth was easily arranged and adjusted in a few minutes, and more than one readjustment was seldom required, one piece of tubing not unfrequently making the whole correction, almost painless, in a length of time varying from a week to a month, according to the powers of endurance of the patient, that being the criterion for slow or rapid progress.

Dr. Kingsbury remarked that a thought or two in addition to what had already been said might not be a work of supererogation. He had a case of irregularity of the right superior central incisor that he was about to

operate on, where he should be very glad to adopt the treatment proposed by Mr. Tomes, if he could be certain of success. So far as the operation was concerned, it would be a very easy matter to put the patient under the influence of anæsthesia, and with a pair of forceps rotate the tooth upon its axis so as to entirely remedy the malposition without pain to the patient.

If the root were perfectly straight and conical, the result might possibly be successful. He would hesitate in performing the operation, except under the most favorable indications; and even then he considered that there would be some risk incurred of rupturing the blood-vessels and nerve-filaments at the apex of the root, and consequently devitalizing the pulp of the tooth.

He was convinced that it would be doing great injustice to Mr. Tomes to suppose from the communication read that he advised this treatment as a general thing. No one could be better acquainted with the anatomy and physiology of the teeth than that gentleman, and it was to be presumed that it was only in a certain class of cases that he practiced or recommended this expeditious and *heroic* treatment.

He was in the habit of producing torsion of irregular incisor teeth by the slower process by means of ligatures, springs, etc.; he was fully satisfied that with young patients where the calcification of the root was not completed, leaving quite an aperture at the apex, there would be but little danger of serious injury to the pulp. He had great respect for the opinions of Mr. Tomes, and had no doubt of his success in the cases referred to.

Dr. McQuillen said that he thought it would not require months, let alone years, to determine the presence of devitalized pulp in the tooth of a young person. Such a marked change takes place in the color of a tooth under such circumstances, even in a few days, that the practiced eye of a dentist of experience would have little difficulty in deciding such a question. Later in life, when the structure of the dentine becomes more dense and the pulp cavity very much lessened in size, and the pulp itself proportionately diminished, it would, no doubt, be more difficult to diagnose the presence of a dead pulp; yet even then there would be a change of shade which could not escape the attention of those whose keen, quick eyes can discover a difference, even though it be but the *shadow* of a *shade*. He felt satisfied that one who had used his eyes so faithfully and so well as Mr. Tomes had done as a microscopist, following not in grooves made by other men, but rather making a pathway himself, would not be likely to overlook the presence of a devitalized pulp, had such a result supervened in any of the cases in which he had operated.

The arguments which had been presented in opposition to torsion, on account of the difference in the shape of the incisors, he admitted had some force; but the fact that the teeth are not fully formed for some time

after their eruption, rendered that practicable, in the earlier years of life, which would be injudicious, if not impossible, at a later period.

Dr. Ellis did not question that favorable circumstances would occasionally combine to produce successful results in isolated cases; and, to accomplish a good so great as the improvement of the human countenance, he would incur many risks, if no other alternatives presented,—but with means at our disposal less painful, more certain, and most satisfactory, he would side with those who discountenance its performance.

He thought with his friend, Dr. Kingsbury, that an undeveloped condition of the terminal portion of the root would remove a serious objection to its performance and enhance the chances of success: yet where the *necessity*, when slight and continued force so readily impresses a tooth thus immature?

Dr. Stellwagen felt that in his present condition (not having any experience of his own upon the subject) he would be extremely cautious about attempting this practice upon his patients; yet the well-known careful observations and sound judgment of the writer of the letter, led him to the belief that under certain favorable circumstances of temperament and state of the system, torsion by means of forceps might be practiced with success. He did not suppose that any one would consider for a moment that so eminent a professional man would make such assertions without having exercised proper circumspection. Dr. S. advanced the suggestion that when due caution is observed, it might be attended with happy results where restriction in time rendered it desirable to save the readjustment of the ligatures, caoutchouc springs, etc. of that somewhat slower and less painful method.

In conclusion, he would call the attention of the gentlemen to the difference in the temperaments of the English and American people; also the diversity of time in the development of their teeth.

Adjourned.

DENTAL ASSOCIATION OF WESTERN NEW YORK.

REPORTED BY GEORGE B. SNOW, D.D.S., BUFFALO, N. Y.

THE third annual meeting of this Society was held in Buffalo, October 4th and 5th, 1865.

After the usual preliminaries, the annual election of officers was held, with the following result:

President.—Dr. Geo. E. Hayes.

Vice-President.—Dr. L. J. Walter.

Treasurer.—Dr. T. G. Lewis.

Secretary.—Dr. Geo. B. Snow.

The subjects for discussion were as follows: 1st. Six-year Molars. 2d. Filling Teeth. 3d. Mechanical Dentistry. 4th. Peculiar Cases.

The discussion of the first subject was opened by Dr. Danforth. He noticed the great penchant of children for improper and indigestible articles of food and the derangement of the stomach consequent upon their indulgence. He also enumerated the various diseases which children were liable to about the time of eruption of the first molars, and attributed the early decay of these teeth, in a great measure, to these circumstances. We must advise the thorough cleansing of the mouth several times a day, and, at all events, insist upon its performance just before retiring for the night. If the teeth were atrophied and rough, would file and polish; if decayed, would fill with the best material the patient would allow him to use.

Dr. French thinks the great cause of the early decay of these teeth is perverted nutrition, both before birth and during early childhood. The food commonly used is not sufficiently rich in phosphates to supply the wants of the organism during the rapid growth of the child.

Dr. Bristol had no doubt that perverted nutrition had much to do with the loss of the teeth, but would ask, how were we to control it? When the patient comes to us, the mischief is already done. It is too late to think of instituting preventive treatment, and the operator can only fill or extract as he thinks best.

Dr. S. G. Wood described a case coming under his observation, in which the first molars were erupted, with scarcely any enamel; only here and there a point was to be seen. The teeth were very sensitive, so much so as to annoy the patient, who wished them extracted. He asked advice as to the proper treatment.

Dr. C. W. Harvey would not extract under such circumstances, believing that the sensitiveness may be overcome by the use of remedial agents.

Dr. Hayes recommended touching the sensitive points with nitrate of silver.

Dr. Whitney agrees with Dr. Hayes. Considers arg. nit. one of the very best remedies for such cases. The patient should avoid the use of acid food of all kinds; should keep the teeth scrupulously clean, use alkaline washes, and dentifrice composed mainly of prepared chalk. He believes, with Dr. French, that we may do much to better the quality of our patients' teeth. We should instruct the mother, and recommend proper food during pregnancy and lactation. The great question is, how to save these teeth. His practice is to fill, if not decayed to the pulp; if not with gold, with tin foil. More care should be used to save these teeth than the bicuspsids.

The discussion of the next subject, "Filling Teeth," took a wide range,

and finally merged into an inquiry relative to the merits of capping or destroying exposed pulps, and the chance of saving teeth by either treatment.

A clinic was held on the morning of the second day's session, Drs. A. P. Southwick and Geo. B. Snow operating.

The subject of "Mechanical Dentistry" being in order, Dr. Daboll gave a description of his manner of taking an impression. He always uses plaster, either for whole or partial sets. If there are soft places on the alveolar ridge, he pares away the model at corresponding points.

Dr. John Lewis uses wax impressions: prefers wax taken from the cards upon which artificial teeth are mounted. The impression-cup should nearly fit the mouth, and should be warmed so that the wax will stick to it. He varnishes the impression, and after the varnish is dry, he dips it in water, shaking off what he can, and runs the models. He uses a mixture of gutta-percha and wax for base plates.

An inquiry having been made as to the cause of the cracking of block teeth, several gentlemen gave reasons for it, which were summed up by Dr. Whitney as follows:

First. Undue pressure upon the rubber from one or more of the following causes: From packing too much rubber in the flask; from not allowing sufficient egress for surplus rubber; from bringing the flask together too quickly, or not heating it sufficiently.

Second. From grinding the gums thin, and not paying sufficient attention to the "draw" of the model in the flask.

Third. From carelessness in removing the plate from the flask, or in finishing.

All these things are under our control, if we use proper care.

Under the head of "Peculiar Cases," Dr. Whitney described two cases of great interest: One, the fracture of the entire upper maxillary arch, so that it had a considerable motion, both perpendicularly and laterally; the other, the loss of the teeth from the mesial line to the second molar consequent upon the extraction of one tooth. The patient was a lad, suffering from scrofula.

The following instruments were exhibited at the meetings: A new extracting forcep, two designs for automatic mallets, and a press for making and truing corundum wheels.

The Association adjourned, to meet at Lockport, N. Y., on the first Tuesday of May, 1866.

EDITORIAL.

ORDER OF PUBLICATION.

As a general thing, the number of manuscript articles, reports of societies, etc. in the editorial drawer would occupy the space of two numbers of the magazine, and, on account of the fact that the articles are published according to the *date of reception*, some delay unavoidably occurs in the presentation of the matter furnished by contributors to the magazine. This explanation is offered with a view of preventing any misapprehension on the part of our friends, trusting that this general notice will be remembered by them in the future, and obviating the necessity of any special explanation by letter.

J. H. M'Q.

BIBLIOGRAPHICAL.

THE STUDENT'S PRACTICAL CHEMISTRY. A TEXT-BOOK ON CHEMICAL PHYSICS, AND INORGANIC AND ORGANIC CHEMISTRY. BY HENRY MORTON, A.M., Emeritus Professor of Chemistry in the Philadelphia Dental College, Professor of Mechanics, and Resident Secretary of the Franklin Institute, and ALBERT R. LEEDS, A.M., Professor of Chemistry in the Philadelphia Dental College and Professor of Chemistry in the Franklin Institute of Pennsylvania. Philadelphia: J. B. Lippincott & Co., 1866. Cloth, \$2.00.

In the compilation of *text-books* or *manuals* for students in the different departments of science, the mistake is too often made of overcrowding the pages with details, and rendering the exposition of general principles so brief and superficial as to be of little interest or service to the beginner. This inexcusable fault cannot have failed to attract the attention of clear-minded and experienced teachers, whose aim and desire are to offer to the student the general principles and facts relating to science in the most lucid, comprehensive, and attractive manner possible: seeking thereby to present the elements or alphabet of science, rather than attempting to crowd the entire science on minds just entering upon such difficult and intricate studies.

In the preparation of the work under consideration, the authors fortunately have avoided this error. The plan on which it is arranged is well described in the following extract, which is the preface to their book, viz.:

"The authors of the following pages have made it their object to produce a book of practical use to the student, by furnishing him with clear and simple explanations of the subject; and to those more proficient in scientific learning, by giving them, in small compass, convenient memoranda of important facts, numbers, references, etc. The effort has also been

made to embody all the valuable novelties in the branches discussed (many of which have not yet been introduced into any text-book), and thus to bring this work down to the present time.

"In the explanation of law and theories, mathematical precision of statement has been less studied than the expression of a clear idea in such form as will be readily apprehended by one not previously conversant with the subject. Thus, such explanations as those on pages 30 and 62 may be well passed over by the well-read man of science as partaking more of the nature of similes than precise statements, but they will have done the work intended for them, if they furnish the beginner with such a general view of the subject concerned as will aid him in recollecting its facts, and pave the way for a more precise and abstract idea in the future."

Starting upon this basis, the work is arranged under two primary divisions: *Part 1st*, occupying about one-third of the volume appropriated to CHEMICAL PHYSICS, gives a brief description of the general properties of matter and the mechanical forces, and presents a fair exposition of the views now entertained relative to the correlated *Forces*, or, as they are sometimes erroneously called, *Imponderable Substances*—heat, light, electricity, magnetism, galvanism, etc.,—as being but varieties of a rapid vibratory movement among the particles of matter.

The colored plate, in illustration of a SPECTRUM ANALYSIS which accompanies this portion of the work, and is said to be the first one published in this country, affords a clearer comprehension of the description in the text of that beautiful and novel process to the young student than could have been gained without it. Indeed, the illustrations throughout the entire work are not only well executed and appropriate, but also more numerous (163 wood-cuts in 300 pages of matter) than are usually presented, and some of them are new and original.

Part 2d, devoted to CHEMISTRY, is divided into two portions, one-half of which is devoted to INORGANIC and the other to ORGANIC CHEMISTRY. Under the first head, the sixty-five elementary substances, now recognized by chemists, and their compounds are described, along with their sources, properties, and uses, in the arts and sciences. Under ORGANIC CHEMISTRY, the various combinations and products of organization in the vegetable and animal kingdoms, and the constant metamorphosis to which organic matter is subjected, are briefly but clearly presented.

Intended as this work is to serve as an introduction to the study of chemistry, and to prepare the way for a clearer and better understanding of the more voluminous and recondite works in this department of science, it will be found a valuable aid to the student, particularly during his attendance upon lectures, on account of the facility with which he can refresh his memory on the points touched upon by the lecturer; and at the same time will be found a convenient work of reference by medical and dental practitioners, and men of liberal education generally. J. H. M'Q.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

*"Inflammation. One of a Series of Original Lectures on General and Local Chemical Disorders arising from Peroxidation, and on the Mechanical Derangements they produce. By H. BENCE JONES, M.D., F.R.S.—*Hitherto in these lectures I have dwelt almost entirely on some of the diseases resulting from suboxidation; I shall endeavor now to give you a glimpse of some of those that proceed from peroxidation.

"Among the multitude of disorders which may be included under the head of acute and chronic diseases of peroxidation, it becomes necessary for this course of lectures that I should choose only one or two subjects which appear to me most convincingly to prove that an excess of chemical action does originate some of the most serious diseases to which the body is liable, and that this first chemical wrong action sets up mechanical derangements which again become the secondary causes of further more or less serious chemical errors.

"In this and the following lecture I shall endeavor to show you that inflammation is a chemical disease, a state of oxidation beyond that which occurs in health, varying in its mechanical results in consequence of the structure of the different textures in which the excessive action is set up.

"Hitherto, altered vascular, and more lately altered nervous action have been considered as lying at the root of inflammatory action. These views are based upon the effect produced by section or paralysis of the nerves of the blood-vessels in increasing the circulation through any part, and on the phenomena which result from the obliteration of one artery going to any part, whereby such increased pressure and action of the blood in other arteries of the part are produced. When, however, the simplest possible case of inflammation, in which neither blood-vessels nor nerves exist, is taken, then we find that there is a chemical action which is independent and anterior to both the nervous and the vascular action; and to trace this excessive oxidation as it arises from physical and chemical action, and as it affects nutrition, circulation, motion, and sensation, is my present object.

"No question lies more near the foundation of all pathological knowledge than that of the nature of inflammation. That it is closely related to the natural actions going on in the body is now fully recognized. Thus, it has been stated to be 'a modification of nutrition,' 'a destruction of the equilibrium in the molecular attractions in the body and of the reciprocal changes between the textures and the blood.' But these expressions are dark and fruitless compared with the clearness you will obtain if I can convince you that inflammation in its origin is an exaggeration or excess of the ordinary oxidizing action that occurs in each part of the body, and that this increased chemical action sets up secondary mechanical derangements, which react on the chemical repair of the textures in which the inflammation is set up.

"The law of the conservation of force must be applied to the heat produced in inflammation as it would be applied to any other question regarding heat. We have ceased to look for the cause of the ordinary heat of the body in vital or nervous action. We look further, and see it coming from part of the amount of force set free by the action of oxygen in the body, a definite amount of the total chemical force giving a definite amount of heat. In inflammation we must look to the same source for the heat. It is no solution to say that the heat comes from increased vital, nervous, or vascular action, and that these arise from the effect of some stimulus. If it be not fresh created, the increased heat must ultimately come from the force that exists in oxygen, hydrogen, and carbon; and it is more reasonable to refer the heat of inflammation directly to the same source as the ordinary heat of the body, thereby making the healthy and inflammatory heat proceed from different amounts of the same chemical action, than to attribute the ordinary heat to the molecular action while the extraordinary heat is supposed to be derived from some other and far less determined source which itself must ultimately be traced to its origin in the slow combustion that never stops within. The most simple case of inflammation that occurs in the body will best show you what takes place in more complicated organs.

"The single fact that inflammation can be set up in the cornea or cartilage, where neither blood nor nerves exist, by increased friction, or heat, or light, or electricity, or by chemical irritants, as cantharides, turpentine, and other oils, or by irritating acids or strong alkalis, is sufficient proof that inflammation does not depend on nervous or vascular action, but that it is caused by increased molecular motion. Heat, and light, and electricity, and chemical actions are forms of molecular motion which, when added to the motion already existing in the cornea or cartilage, give rise to increased oxidation of the non-nitrogenous and nitrogenous substance, even in the bloodless textures; and this altered oxidation immediately determines an altered chemical circulation of lymph and an altered nutrition in the inflamed part.

"That oxidation takes place where there is no blood circulation is shown in an experiment on the respiration in the muscles of the frog by G. Liebig. The muscles, even when they were deprived of all their blood, if placed in oxygen, gave rise to carbonic acid and retained their power of contraction.

"The increased molecular motion in the cells of the cartilage produces increased chemical circulation of lymph, increased consumption of oxygen, increased liberation of heat and of oxidized products, and ultimately of water and carbonic acid. This action spreads from cell to cell until it reaches the capillaries.

"A capillary in ordinary action contains blood globules loaded with oxygen in its centre, with liquor sanguinis moistening the tube around. Oxygen diffuses from it with the lymph into the cells and structures, and thereby active oxidation is kept up outside the capillaries in and around the different parts of the different textures. The peroxidation which constitutes the first step of inflammation begins outside the capillaries where the animal heat is produced.

"When the increased action reaches the capillaries, the oxygen bearers are, by the demand for oxygen, attracted in excess: they displace the liquor sanguinis—at first producing a more rapid flow through the part, and quickly rushing in, so as to cause a heaping up of the blood globules,

giving rise, first to enlargement of the vessels, and then to obstruction, which immediately reacts on the heart, increasing the pressure and rate of the blood in all the arteries, among others, in those around the obstructed part, so that stronger motion of the blood occurs around the obstruction, and thus a larger area of increased chemical action tends continually to be produced.

"That the first mechanical congestions can be caused by increased chemical actions, and not by any nervous action affecting the heart, is proved by the fact that when the circulation is arrested by a ligature in the frog, and then irritating substances are applied below the ligature, the blood is seen to be attracted to the irritated capillaries, which will remain congested after the circulation is re-established by removing the ligature.

"In the obstructed part the mechanical results of overfullness and pressure show themselves. The pressure causes pain, and the increased supply of blood makes the nerves around the obstruction more sensitive than when less blood is there.

"The tension causes the serum to be effused, and even fibrin, altered by the peroxidizing action going on, also exudes when the pressure increases, and this fibrinous exudation causes intestinal thickening, and constitutes a much more permanent obstruction than the liquid matter, which can rapidly be reabsorbed.

"When the primary increase of chemical action is excessive, the whole blood participates in it. Peroxidation not only causes an excess of fibrin, but it produces a higher state of oxidation of the fibrin than exists in health. The membrane of the blood globules also probably is altered in composition and becomes more adhesive, so that the blood globules aggregate together and fall more quickly when the blood is drawn from the body, while the altered fibrin contracts more firmly than ordinary fibrin usually does.

"Oxidation and pressure cannot be increased in any part of the body without the chemical and formative actions of nutrition being at the same time altered. The destruction of old substance will be more or less increased, and the deposit and formation of new substance will undergo great changes, according to the heat that is present, and according to the different textures of the parts in which the increased actions are going on.

"The cellular tissue furnishes perhaps the best example of altered nutrition during inflammation. There the increased action most rapidly leads to excessive cell-growth; pus-cells soon form and quickly multiply, according to the amount of increased action. The cell-growth spreads in that direction in which there is least resistance until the products of the altered nutrition are discharged.

"When the obstruction is extreme and the pressure excessive in any part of the cellular tissue, oxidation and nutrition may be entirely stopped, and, though excessive action may be going on around, the part obstructed may die, and in it an entirely different sort of chemical action will then be set up, which will continue until the slough is removed.

"If, then, in a few words, I try to give you a summary of what inflammation is, I say that it has its origin in the causes which produce the natural heat of the body. The oxidation rises to a peroxidation; it is a purely chemical wrong, producing almost immediately a secondary mechanical derangement,—increased motion of the blood-globules—from

which excessive motion and obstruction of the blood-vessels arises. Hence proceed increased tension, increased pressure, and increased effusion of lymph from the liquor sanguinis. The effused fluid varies in its composition with the amount of pressure and oxidation. Lastly, from the increased heat, and the increased circulation, and the increased effusion of lymph, an entire change in the nutrition of the part follows; and these actions are so related, and so react the one on the other, that it is difficult exactly to estimate the part which each one separately plays in producing the result.

"In whatever part or texture of the body the inflammation is set up, the structure of the part will have an important effect on the chemical and mechanical actions that take place in it. Peroxidation will occur much less readily in the liver than in the lung. A resisting bone will oppose a much greater obstacle to congestion than an unresisting skin. Even in different textures of the same organ, the inflammatory action will be modified by the greater or less resistance of the different textures to oxidation and pressure. The inflammation of the outer unyielding covering of the lung will differ entirely from inflammation of the yielding mucous membrane of the bronchial tubes; and the finer structure of the air-vesicles, and of the capillaries on their surfaces, will give rise to very different results from the inflammation of the coarser mucous membrane. Let me for a moment contrast bronchitis with pneumonia.

"The increased oxidation in the mucous membrane causes increased fullness of vessels, increased secretion of fluid containing modified albumen and salts, which wash off the epithelium; increased production of the lowest epithelial cells; interference with the passage of air to the air-vesicles. Gradual interstitial thickening of the tubes by fibrin, and even increased growth of the muscular coat in long-continued cases, may occur. In other words, the structure of the mucous membrane of the bronchial tube, and even its muscular and fibrous textures, determine to a greater or less degree the products and the results of the bronchitis.

"In the air-vesicles, no epithelium, no muscular coat exists; the oxidation causes congestion of the capillaries; thence comes an exudation of blood-stained albuminous liquid, and the rapid effusion of oxidized fibrin into the vesicles. In the effused substance and in the obstructed capillaries, further chemical changes and altered nutrition then occur, while the mechanical obstruction, according to its extent, limits and retards the great chemical action which is going on between the oxygen of the air and the red globules of the blood.

"The same chemical stoppage of aëration of the blood follows, not more surely, but much more manifestly, from mechanical action by an accumulation of fluid in the pleura. The structure of this tissue determines the effusion of altered serum and fibrin whenever excess of oxidation causes congestion of the capillaries. The amount of fluid and solid matter effused depends on the amount of obstruction of the capillaries, and the pressure is transformed to the surface of the lung; and, as it increases, the chemical action in the lung is lessened until so little oxygen passes into the air-vesicles that extreme sub-oxidation ends in stopping all the actions that constitute life.

"In order, however, to bring before you still more clearly the dependence of mechanical on chemical diseases, and the alteration of chemical function by the alteration of mechanical structure, I shall occupy your attention in this and in the following lecture with those different structural

affections which, under the name of Bright's disease, have so united chemistry to medicine that, as regards this disease at least, no one can even now say that it is possible to be too chemical. For only by chemistry can the disease be recognized, only by chemistry can its progress be traced, only by chemistry can the effect of the different poisonous substances retained in the blood and in the textures by the stoppage of their chief means of escape be comprehended, and only by chemistry can the actions of the different means of promoting recovery be understood."—(*Med. Times and Gaz.*)

"Osteoplasty. By DR. KADE.—The word osteoplasty was first used by Pirogoff to denote his modification of Syme's amputation at the ankle-joint; and it was afterward used for a class of operations similar in principle, in which cut-surfaces of bone were opposed and made to unite, such as resection of the elbow and of the knee. Langenbeck, however, employed the word in a different sense to denote his first case of rhinoplasty with transplantation of the frontal pericranium, and afterward for two cases of 'osteoplastic' resection of the upper jaw, and for his first case of uranoplasty. Hence the meaning of the word has become obscure. It is evident that there is nothing truly osteoplastic about Pirogoff's amputation, or about resection of the knee, or in separating portions of the upper jaw, and replacing them after the removal of a tumor. For the future, the term osteoplasty should be applied only to operations in which periosteum is transplanted for the purpose of producing new bone, as in the nose and palate cases mentioned above.

"After tracing down the history of our knowledge of the power of periosteum to produce bone, and after referring to the experiments of Flourens, Dr. Kade describes the more recent ones of Ollier. He detached strips of periosteum from the tibiæ of rabbits, leaving them adherent to the bone at one end only, and wound them about among the muscles and under the skin in various directions: thus obtaining new bone of any desired shape. In a second series of experiments he completely severed the connection between the strip and the bone on the fourth day; and in the third he severed this connection in the first instance, and transplanted the periosteum to various parts of the body. In all cases a formation of bone was the result; not a mere calcification of connecting tissue, but a formation, possessing all the characteristics of osseous structure.

"The first application of this property of the periosteum to operative surgery is due to Langenbeck; although the suggestion so to use it was made by Ollier. Malgaigne in 1834 advocated the preservation of the periosteum in resections, on the ground that in children it formed a basis for new bone, and in adults for fibrous tissue; and Sexter, Sen., in 1839, preserved the periosteum of a partially carious rib with full knowledge of the results to be obtained from doing so. Since then, the same thing has been done by many surgeons; but the transplantation of periosteum is manifestly a step in advance of its mere preservation.

"The results hitherto obtained from osteoplastic operations have been very satisfactory. Langenbeck has recorded two cases of rhinoplasty; in the first of which firm new bone was formed in four weeks, and in the second in eight. Dr. Kade saw him operate on a third case, and saw the patient again six weeks afterward. The operation had been very diffi-

cult and tedious; and the point of the new nose had sloughed. At that time no bone could be discovered in the bridge.

"On the hard palate the results have been more favorable; and Dr. Kade refers to eleven cases of uranoplasty by Langenbeck, and to one case of his own, performed in January, 1862, in which he fully describes the several stages of the operation. The patient was a peasant lad, seventeen years old, with congenital fissure of the lip, hard palate, and velum on the left side. The staphyloraphy and uranoplasty were both accomplished at one sitting.

"The first step of the operation was to pare the edges of the fissure. In doing this, the knife was carried from behind forward, and from below upward, so that parts still uncut were not obscured by bleeding. In consequence of the scanty development of the velum, it was impracticable to remove its margin in a continuous strip; and the paring was done piecemeal, and with some difficulty. The fissure of the palate itself was pared more easily, and the operator found it most convenient to stand behind the patient, supporting his head upon his breast. The same position served for the lateral incisions and for the separation of the periosteum. After paring the fissure, the author proceeded to make his lateral incisions; thus departing from the practice of Langenbeck, whose second step is the section of the muscles of the velum. Dr. Kade defends his own practice partly because he thus proceeds continuously with what can be done from behind the patient, and chiefly because the myotomy is attended with acute pain and free bleeding, and requires a long interruption of the operation. In the case under consideration, the cleft of the hard palate being unilateral and not very wide, and the palate process of the superior maxilla not too small, it was sufficient to make a single lateral incision, on the side on which the palatine process was not united to the vomer. The third step, the separation of the muco-periosteal covering of the palate, should be commenced on the right side from the margin of the cleft, on the left side from the side of the teeth. When the muco-periosteal covering has been separated by an elevator as far back as the posterior margin of the palate plate of the palate bone, the mucous membrane of the velum must next be separated from this margin. For this purpose, a straight probe-pointed knife should be carried along the margin from within outward, as far as the hamular process. In raising the periosteum, it is necessary to be very careful to avoid the incisive foramen and the posterior palatine foramen, which give passage to the nutrient vessels. It is easy to avoid the naso-palatine artery, which passes through the incisive canal, since the fissure is usually small anteriorly; and no very extensive separation of periosteum is there required. In experiments on the dead subject, the author found the anterior palatine artery, which passes through the posterior palatine foramen, always uninjured, even although he separated the periosteum with but little care. He thinks, moreover, from the very free anastomosis upon the palate, that the vitality of the flaps would not be endangered, so long as one of the nutrient vessels remained intact. The fourth step is the introduction of the sutures, which can be done more easily while the velum is tense than when it has been relaxed by myotomy. The author used nine sutures, five in the palate and four in the velum. As each thread was passed, he stuck together its free ends by a bit of wax, and gave them in charge to an assistant. The fifth step was the myotomy, for which a sickle-shaped knife was thrust through the velum, below and somewhat external to the hamular process, toward the poste-

rior wall of the pharynx, and the velum was then divided in its whole thickness, by sawing movements of the knife, up to the posterior margin of the palate bone. It is desirable to divide the levator and circumflexus palati at a distance from the median line, where they are small, and prior to their fan-like expansion; but it is an error to suppose, with Langenbeck, that the palato-pharyngeus can be divided by the same incision. The author thinks that Langenbeck's incision is insufficient to relax the velum; and that the palato-pharyngeus or posterior pillar, and the palato-glosses or anterior pillar, require to be separately divided. He neglected to do this, and the fissure of the velum did not unite after his first operation, but only after a second, in which the pillars were cut through. After the myotomy, the patient requires a period of rest; and then the operation is completed by tying the sutures.

"In the author's case, the fissure of the palate was perfectly closed, and the second (successful) staphyloraphy was performed a month after the first. In March the hare-lip was united, and healed by the first intention; and at the end of the same month, a needle discovered new bone in the place of the former cleft of the hard palate. The speech was still defective, the patient being stupid, and having neglected to carry out the necessary vocal gymnastics."—(*Schmidt's Jahrb.* and *Ec. Med. Journ.*)

"*Autoplastic Operations.*—Autoplastic operations are seldom followed by satisfactory results, and in most cases it is preferable to be satisfied with protethetic appliances, than to incur the risk of delicate and painful procedures of doubtful utility. Some deformities, however, are so extensive, and of so hideous a character, as to render life actually unbearable, and in such cases it is a duty to seek in surgery for some remedy calculated to alleviate the calamity.

"An instance of the kind recently occurred in Professor Denonvilliers' practice, in which that surgeon's usual good fortune and remarkable dexterity enabled him to attain unhopd-for success.

"Mr. Denonvilliers presented to the Society of Surgery a woman in whom he had restored the lower part of the face which had been destroyed twelve years previously, when the patient was sixteen years old, by mortification consequent on typhoid fever. The destruction of the lips, of the right cheek, and of a portion of the nose, had rendered the aspect of this unfortunate woman so hideous, that she inspired all those who saw her with a feeling of horror. Mr. Denonvilliers undertook the difficult task of the reconstruction of the face, and after numerous operations at intervals of several months at last succeeded, by dint of patience, care, and dexterity, in restoring to her not a handsome or expressive countenance, it is true, but one which no longer inspires repulsion and disgust. The professor established the principle that no satisfactory result can be expected from procedures instituted for losses of substance consequent on gangrene of the month, unless a long period has elapsed between the date of the mortification and the attempted restoration. The morbid tendency must have been exhausted by time before any surgical proceedings are thought of, otherwise the mortification is liable to recur in the part. Cicatrisation takes place, it is true, as after any other autoplastic operation, but in a short time the flap shrivels and mortifies. An interval of several years must therefore elapse before the surgeon can attempt restoration of the mouth with any chance of success.

In the present case, twelve years intervened between the gangrenous disease and the reconstruction of the face, and the results have now endured ten years."—(*Journ. of Prac. Med. and Dub. Med. Press.*)

"Double Complicated Hare-Lip.—DR. GURDON BUCK exhibited to the New York Pathological Soc. a specimen which was one of abnormal development, and consisted of a cast taken from the face of a girl ten years old, who, though otherwise well constituted, had the misfortune to have a double complicated hare-lip. The complication consisted in the presence of a rather remarkably prominent intermaxillary bone, supporting three incisor teeth, the cleft passing entirely through the uvula as well as the velum

"An operation was performed, which consisted in dissecting up the flap attached to the nose, the median central flap. That was detached then as the first step, and held in reserve. The projecting intermaxillary bone was then pared off on a horizontal line. That flap was then trimmed, and the edges squared, so as to cover the inferior edge of the fresh cut septum. The lip on either side was very freely detached as far outward as the molar teeth, so as to facilitate the advancing forward of the two sides, and bring them into approximation. The edges were then trimmed, and secured by twisted and interrupted sutures. The sequel of the case was in every way favorable. Within a week all the sutures were removed, and a photographic view shown proved how complete the result of the operation had been.

"Dr. Sayre referred to a case of deformity very similar to the one presented by Dr. Buck, and stated that in that instance he had left the septum, crowding it back somewhat, to form a support for the base of the nose. The nose, under these circumstances, would be turned up a little, but the advantages gained in the support more than counterbalanced it. This case was operated upon ten years ago, the third day after birth, and the result showed the wisdom of the decision to interfere thus early. Although two incisor teeth were removed at five years of age, the bone was firmly adherent, and at ten years of age every vestige of the operation, as far as the bone was concerned, had disappeared. He advocated the practicability and propriety of performing all such operations as soon after birth as possible; the child for the first two or three days would sleep a great deal, was very quiet, and the healing of the soft parts was generally so rapid that the mouth would be in a condition to perform the function of nursing when the mother's breast should be ready. He was informed by Dr. Jacobi that authorities agreed in recommending the practice of early operating, and was delighted to know that his experience of ten years ago was finally substantiated and recommended."—(*New York Med. Journ.*)

"Engrafted Tissues.—The experiments of M. BERT are of the highest interest, as they show that the tissues of one animal may not only be engrafted on those of another, but that after a time they become supplied with blood-vessels, etc. The following case, which has just been published, is very instructive: The tail of a full-grown rat was removed from the body, and then inclosed in a glass tube, and maintained for seventy-two hours at a temperature of from $+7^{\circ}$ to $+8^{\circ}$ centigrade. It was afterward deprived of portions of its skin, and introduced into the sub-

cutaneous cellular tissue of another adult rat. Three months afterward the second animal was killed, and coloring matter was injected into its aorta. This coloring substance absolutely penetrated the marrow of the engrafted vertebræ, thus showing that the tail had been supplied with vessels communicating with those of its host's body."—(*Lancet*.)

"Dermary Cyst—Pelvic Abscess—Discharge of Hair.—DR. KRAKOWITZER presented to the Pathological Society of New York a very curious specimen, which he had obtained, by chance, from an abscess situated near the rectum. A girl, twelve and a half years old, of healthy family, had had typhoid fever last summer. During the first week of November last, she had the first signs of menstrual flow, lasting for about two days. About the end of November, she commenced to complain of pain in the limbs, especially the left, became feverish, suffered from pain in the abdomen, and her bowels were regulated with difficulty.

"Three days before Dr. Krakowitzer saw her, she had been unable to pass water, and when he was called, he found her with an immense dilatation of the bladder, which extended up to near the umbilicus. A catheter was introduced, and not a drop less than *three quarts* of urine evacuated. The labiæ and vulva were tumefied, and discharged a good deal of milky mucus. The opening of the hymen was found large enough to admit a finger, and on examination the whole of the pelvic cavity was found filled by a soft fluctuating substance, which gave at first the impression that it was an hæmatocele. But, on further examination, it was discovered that the rectum was *in front* of, and *not* behind the swelling. An extensive pelvic abscess was diagnosed, and an incision made between the anus and coccyx gave vent to a considerable quantity of purulent matter. The finger was introduced into the wound, and the parts behind the rectum appeared to have been dissected off by the suppurative process. During the progress of this examination the finger met a substance imbedded in the abscess, which, on being withdrawn, was found to be a *bundle of hair*, or rather *two whirls of hair*, connected together by shreds, here presented. There were discharged, also, shreds of a cheesy-like matter, consisting of granular matter, crystals of cholesterine, etc. The *cause* of the formation of this abscess, in his opinion, was undoubtedly the presence of a *dermary cyst*, which had become inflamed, and caused suppurative inflammation. The child is doing well, with the exception that some paralysis of the bladder is left; the wound is still discharging healthy matter, but so far no other evidences of dermary cyst have been passed, such as teeth or bones.

"The question as to the original seat of the cyst in this case is an interesting one. If in the ovary, it is difficult to comprehend how it should eventually get behind the peritoneum, and immediately in front of the sacrum. The origin of these cysts is considered as always taking place during foetal life, by invaginations of skin, which, as development of the foetus progresses, become entirely detached from the original structure and imbedded in one of the internal organs. Cruveilhier describes two or three cases, and Virchow observed two dermary cysts in the brain of a new-born infant, where he could still find the traces of a canal leading from the cyst to the scalp.

"Dr. Jacobi mentioned that he had seen bone and teeth in the testicle;

the pelvis, as a general rule, was the seat of pre-election of these cysts."—(*Med. and Surg. Reporter.*)

Etherisation.—"M. PETREQUIN, of Lyons, brought the subject of *etherisation* the other day before the Academy of Sciences. It seems that he and almost all the Lyonese surgeons have adopted ether in preference to chloroform during the last fifteen years, and have met with no fatal cases or serious accidents, while complete anæsthesia has been promptly and effectually secured. Its free adoption at first was impeded by three circumstances, which no longer prevail. 1. The defective and complicated character of the apparatus employed. These have been now superseded by a simple contrivance, termed a *sac à étheriser*, which is admirably efficient. 2. The ether employed at first was of insufficient strength and impure. A strong, pure, concentrated, rectified ether at 62° or 63° is now sold for the purpose at the Lyons' *pharmacies*. 3. The inexpertness of the early manipulators is now exchanged for a dexterity which induces quiet and speedy etherisation; while a careful observation of the pulse and respiration secures the patient from all accidents, which are easily averted, when threatening, by temporary suspension of the inhalation. Such accidents, under ether, are always progressive, and not sudden, as under chloroform. They may be anticipated or arrested, and never present themselves with the formidable rapidity characterizing some of those induced by chloroform. M. Velpeau, while believing that the statement of the entire innocuity and prompt utility of ether made by so important a body as the Lyons practitioners is highly deserving of the attention of the Academy, does not think the argument for its preference over chloroform at all conclusive. Many of the dangers attaching to this latter agent may also be due to its impurity or unskillful application; but, speaking from his own experience, he has employed chloroform in many thousand cases during the last fifteen years, without ever meeting with a fatal case. This, too, is the case with many of the surgeons in the best practice in Paris, and with the entire school of Strasburg. In fact, either agent may have its useful application under different circumstances."—(*Med. Times and Gazette.*)

Nitrous Oxide and other Anæsthetics. BY J. M. CARNOCHAN, M.D., Surgeon-in-Chief to the State Emigrant's Hospital, New York, etc. etc.—"I desire to present through the pages of the *Medical and Surgical Reporter*, a general statement of the facts respecting three surgical operations which I performed, using nitrous oxide gas, administered by Dr. Colton, as the anæsthetic, and my opinion on the value of this agent as compared with chloroform and ether.

"The first operation took place on the twenty-second of last July, and was the removal of the entire breast, and glands of the axilla, for cancer. The patient, a lady in feeble health, was suffering from disease of the throat and lungs and general debility. In thirty-five seconds from the time she began inhaling the gas, she was in a profound anæsthetic sleep. She remained insensible for sixteen consecutive minutes, until the operation was completed, and in forty seconds, from the time the bag was removed, awoke to consciousness without nausea, sickness, or vomiting, as is so often the case with the inhalation of chloroform and sulphuric ether.

"The second and third capital operations occurred at the State Emi-

grant's Hospital, on the second of December, and consisted of two amputations of the leg. The time required to produce an anæsthetic sleep in the first patient, a male adult, extremely debilitated and worn out by disease, was forty-five seconds; whole duration of the operation and influence, two minutes and a quarter. No nausea or unpleasant symptoms.

"The third operation was on a boy of about thirteen years of age. The time consumed in the inhalation, operation, and recovery from the anæsthetic sleep was two minutes, the gas working equally as in the other cases, and the patient, after complete anæsthesia, awaking entirely free from unpleasant symptoms.

"For minor operations, or for capital operations, such as amputations, which when properly performed should require but a few minutes, I have no hesitation in stating that the nitrous oxide gas, as an anæsthetic, is far superior to either chloroform or ether. Insensibility is suddenly produced, and the patient recovers consciousness quickly, the operation being attended by no nausea or sickness, and without the dangerous effects often incident to chloroform and ether.

"It is worthy of remark that the nitrous oxide gas approximates, in its chemical combination, to the composition of the ordinary atmosphere, and we may thus, inferentially, account for its more favorable influence. Whether it can be used in operations which from their nature require from half an hour to an hour's time, remain still to be proved by actual experiment.

"The duration of the anæsthetic influence in the case of the first operation, previously alluded to, is the longest on record; and I may here state that this is the first capital operation performed under the influence of the gas, since the great discovery of Wells of Hartford, twenty-two years ago, that a harmless sleep could be produced by a chemical agent, which could annul for the time being the greatest suffering. It is not at all improbable that had Wells lived and had the boldness to follow up his early successful experiments, chloroform and ether would never have been thought of as anæsthetics.

"To G. Q. Colton is due the credit of reviving the use of this important agent, in the practice of dentistry, after a lull of twenty-two years.

"The value of a safe anæsthetic agent, which can be used without anticipation of danger by the patient, is a great boon to suffering humanity, and I have related thus minutely its action in my own cases, in the belief, that if similar favorable results are met with by others, the nitrous oxide gas will supersede all other anæsthetics now in use."—(*Med. and Surg. Reporter.*)

"*Work and Waste.*—Every manifestation of physical force involves the metamorphosis of a certain quantity of matter. Prof. Houghton, of Trinity College, Dublin, asserts, as the result of his investigations, that, in the human organism, there is a definite relation between the amount of force exerted and the amount of urea generated. The urea formed daily in a healthy man, weighing 160 pounds, fluctuates from 400 to 650 grains. Of this, 300 grains are the result of vital work; that is, of force expended in the motions of the digestive organs and the heart, and in sustaining the temperature of the body at a uniform rate. This amount exceeds all other force generated and expended in the system, and is equal to that required to raise 769 tons one foot high. In addition to the mere

act of living, the workingman undergoes bodily labor equivalent to lifting 200 tons one foot high daily, which requires the formation of 77.38 grains of urea. *The force expended in two hours of hard mental labor involves an expenditure of power equal to lifting 222 foot-tons, and a generation of urea weighing 86 grains.* Thus we have a minimum formation of urea during twenty-four hours, amounting to 477.38 grains, for which there is expended force equal to 969 foot-tons.—*Annual of Scientific Discovery for 1865.*

"In commenting on the above, the editor of *The Circular* (Wallingford, Conn.) says: 'Those who fancy that the student or the writer who sits almost motionless at his desk is "doing nothing," should note the above statements, particularly the one we have italicized. According to the test given by this writer, the brain-worker expends in two hours more lifting force than the Irishman does in a whole day's digging in a canal.'"
—(*Amer. Artisan.*)

"Effect of Acid Mixtures on the Teeth. By WILLIAM D. NAPIER, M.R.C.S., and Dental Surgeon.—Permit me, through the medium of your paper, to beg as a favor of your many professional readers that they will give consideration to the following subject, of great importance to the public, and one that I feel assured only requires ventilation to attract the attention it deserves. My object is to point out the daily increasing necessity that all prescriptions containing acid in any form, however much diluted, should be accompanied by proper precautions as to their use. So serious are the evils arising from the neglect of such a measure, that I feel it my duty to bring the subject forward without further delay. When I assure you, sir, that contact with acid is more permanently prejudicial to the teeth than anything I could mention, you and your readers will be able to make your own estimate as to the amount of damage the public at present sustains from this cause. I am quite aware that some medical men accompany prescriptions of this nature with directions for the use of a glass tube or medicine spoon, with a view to avoiding their deleterious effects in the mouth, but these I hold to be inefficient for the purpose, and I strongly advocate the substitution of an antacid, for which the following simple form would suffice: 'Wash the mouth with a little sal volatile and water before and after taking the mixture.' Should exception be taken on account of the additional trouble that this would involve, I am sure that all respectable chemists and druggists would readily adopt a printed form to the same effect, which could be affixed to every bottle containing an admixture of acid."—(*Med. Times and Gaz.*)

"Electricity the Cause of Animal Colors.—M. NICOLAS WAGNER has recently brought before the Academy of Sciences experiments which seem to show that electric currents are the cause of the colors, at least of some animals. These experiments were made on the nymph of a species of diurnal butterfly (*Vanessa urtica*). Electric currents changed the reds into orange, and the blacks into red; and the most feeble currents, especially if from a constant battery, produced black spots, the shape of which had a relation to the current. He ascertained, by means of an extremely sensitive apparatus, that not only does electricity modify and even produce colors, but that those found in the butterfly are due to cur-

rents in the wing of the animal—the most energetic of which issues from the base of the wing, and follows the middle nervure till it reaches the outer edge.”—(*Intellectual Observer.*)

“*Zopissa Paper.*—COLONEL SZERELMEY is best known in this country as being the most successful among the many competitors for the treatment of the stone decay in the new Houses of Parliament. But he has made it the study of his life, during many years of foreign travel and research, to attain a knowledge of what the *zopissa* of the ancient Greeks was composed of. This is one of the ingredients in most of his compositions. But our main business just now is with the products from his paper pulp, treated and manufactured in a way peculiarly his own. They were shown at the exhibition of 1862; but, like many other things, they did not then attract the attention they now apparently deserve. If half of what the colonel and his friends say turns out to be true, his will rank among the most important inventions or discoveries of this generation. He professes to make *zopissa* paper boards stronger and cheaper by fifty per cent. than oak, indestructible and perfectly water-proof. They can be made of any length and thickness, and may be cut to any shape, like wood, with a common saw. They will resist a pressure of 250 pounds to the square inch, or more if required. They are said to be suitable for ship-building, the construction of portable houses, roofing, flooring, coach-panels, boxes, piano, and packing cases, etc. The paper pipes for water, gas, liquid manure, etc. are produced from the same substances as the boards, and have the same properties. They can be made of any length, diameter, and thickness required, and can be constructed to bear almost any pressure to the square inch. They are said to be fifty per cent. cheaper than iron pipes; they are not affected by gas or water; not being porous, no leakage can take place from them, and the material being a non-conductor of heat or electricity, they possess many advantages over all other pipes, besides keeping the passing water cool in summer and unfrozen in winter. Rocket tubes, cartridge-cases, large guns, and even houses, are to be manufactured of this paper. Its power of resisting shot is said to be ten to one greater than that of oak. It can be easily moulded to any form desired. It is capable of being used in mass, without waste, like fusible metal. It is entirely free from moisture; and while any ordinary paper would corrode iron, this can be made to adhere to and form a covering impervious to water over it. It is said that it must eventually be generally used as a covering for boilers, steam tubes, funnels, etc. The raw material, we are informed, is much cheaper than any now in use, and its manufacture simple. But what strikes us most at the present time—just after a second failure to establish telegraphic communication with America—is the confident assertion of Colonel Szerelmey's friends, well known in several circles, that by the use of this *zopissa* paper alone, of all the materials at present known, can a perfect electric cable be formed. We were shown a rope of less than an inch in diameter, with an ordinary copper wire projecting at each end through its centre. This rope was formed neither of hemp, India-rubber, gutta-percha, cork shavings, nor any ordinarily recommended covering—but simply of *zopissa* paper. It is almost impossible that it can break; it will not stretch, and thus throw the strain on the copper wire, although it is perfectly flexible. Lastly, it has been reported by some of the most

skilled electricians of the day as being perfect in insulation and other respects. Now, if anything like what we have heard as to the practicality of this discovery, and its application to so many of the purposes of life, its cheapness, its durability, its comparative safety from fire, and so forth, be feasible, it is high time that the public took pains to be thoroughly informed on the subject. Colonel Szerelmey has been many years among us as an Hungarian exile. He has earned the right to have the merits of his invention fairly tested.”—(*Practical Mechanics' Journal and American Artisan.*)

“*Rendering Wood Plastic.*—A very simple method of rendering wood plastic has recently been discovered. It consists in injecting diluted hydrochloric acid into the wood under a pressure of about two atmospheres. The duration of the operation must be regulated by the nature of the wood, the bark is not removed, and by a very simple arrangement the liquid injected at one extremity may be partially collected at the other. If the green wood is submitted to pressure, the cellulose having been previously washed with water, it may be reduced to a tenth of its original size; the fibres may be excessively compressed without breaking or tearing, and when dry have no tendency to resume their natural condition. Woods treated in this way will serve for many purposes. If after the treatment with hydrochloric acid the wood is washed and dried, it may be cut and chiseled with great facility, and serves admirably for sculptural purposes. The wood is dried by passing air under pressure through the cellulose at about 37° , the moisture is rapidly expelled, and as the mass contracts evenly throughout, there are no cracks. Colors or the various substances which prevent wood from rotting may be injected in a similar manner; soluble glass or freshly precipitated silica renders it very durable and at the same time incombustible.”—(*Chem. News.*)

“*Caseine in the Arts.*—In a recent lecture DR. F. G. CALVERT states (*Chem. News*) that “the principal applications of caseine in arts and manufactures is that first introduced by Mr. R. T. Pattison, who used it, under the name of lactarine, for fixing pigments in calico printing. His process consists in drying the washed curds of milk, which he sells to the calico printer, who mixes it with a solution of ammonia or weak alkali, which swells it out and renders it soluble in water. To a solution of this substance, of proper consistency, he adds one of the tar colors, prints it, submits the goods to the action of steam, which drives off the ammonia, leaving fixed on the fabric the caseine and color. In consequence of the insoluble compound which caseine forms with lime, it has often been used as a substitute for glue or linseed oil in house painting, and it may be useful to some of my audience to know that when caseine is dissolved in a concentrated solution of borax, an adhesive fluid is formed, which is capable, in many cases, of serving the purposes of glue or starch. Mr. Wagner has made another useful application of caseine, mixing it with six parts of calcined magnesia, and one part of oxide of zinc, and a sufficient quantity of water to make a pasty mass, which he leaves to solidify, and when dry it is extremely hard, susceptible of receiving a high polish, and is sold as a substitute for meerschaum.”

"Softening Clay. By PETER HART.—Your last week's number contains a note on the softening of clay for modelers, by means of glycerin—will you allow me to point out to each of your readers to whom it may be of use a cheaper method of effecting the same object? Some year or two ago I had an apparatus at work in my laboratory, parts of which required at intervals to be removed, replaced, and reluted. The mixing of fresh pipe-clay and water every day or each time it was necessary became a bore, so I mixed a quantity once for all, using a solution of chloride of calcium of about 1.350 specific gravity instead of water. I found that I had fully achieved my object, inasmuch as my luting kept good during the whole course of the experiments, and, further, the other day I picked up in a by corner of the laboratory a piece of this very same luting, as soft, as plastic, and evidently as fit for use as ever. I may add that at the time it struck me that I had read that it was necessary for modelers to keep their clay in a soft state, but I also thought it was necessary that it should be capable of being dried—which when mixed with chloride of calcium it would be impossible to do."—(*Mechanics' Magazine and Sci. Amer.*)

Plastic Sulphur.—"M. A. KELLER communicated to the Chemical Society of Paris some *Remarks* on a note by MM. Moutier and Dietzenbacher '*On a New Property of Sulphur.*' Our readers will remember that these gentlemen stated that sulphur could be rendered soft and plastic by fusing it with a trace of iodine or some paraffine, lampblack, etc. M. Keller has tried every one of the substances named, but has never succeeded in producing the result stated, unless he poured the sulphur either into cold water or in a very thin layer on a very cold porcelain tile, under which circumstances sulphur alone is always made soft and plastic."—(*Chem. News.*)

"Solvent for Shellac.—MESSRS. EDITORS: One of your correspondents asks if you can inform him of a solvent for shellac, and you replied, that 'alcohol was the only menstruum that completely dissolves it,' or some such answer. I have not the paper before me, and cannot give the exact words. It may be of some benefit to him to know that a saturated solution of borax will completely dissolve shellac."—(*Sci. Amer.*)

"Water boiled in Paper Vessels and Straw Baskets.—A French physicist has shown that water may be boiled in paper vessels, and that the paper will even endure a temperature much higher than this. The Digger Indians of California are in the habit of illustrating a similar fact by boiling water in baskets of finely woven grass. These baskets indeed constitute the principal cooking utensil of the wandering Digger."—(*Pacific Med. and Surg. Journ.*)

"Effects of Heating, Rolling, Hammering, and Annealing Metals.—Elaborate experiments and careful observations have developed many interesting and important facts with regard to the variations of density, etc., which different metals undergo in different degrees in the operations of heating, drawing, rolling, hammering, and annealing.

"At a temperature rather above a cherry-red, iron wire will remain

three months, surrounded with charcoal, without cementation taking place, while a white heat will, in five minutes, render brittle a square bar of malleable iron, eight-tenths of an inch in diameter.

"Wires of copper, and of alloys of copper and zinc, are increased in diameter, and diminished in density, by annealing. The operation of rolling condenses metals more than that of wire-drawing. The density of iron and copper will be greater if the metals are heated before being passed through the rollers. The reverse is the case with alloys of copper and zinc. The density of metals is greatest when drawn into very fine wires. Hence, two small wires are stronger than one large one of the same transverse area with the united areas of the small ones. This result grows out of the fact that the particles of the smaller wires are compacted throughout their entire cross section, while those of the latter are thus compacted for a certain depth only.

"Wires may be increased in length in two ways: first, by diminution in the case of its cross section; and second, but only in a slight degree, by increasing the distances between the component particles. When wire is lengthened by the latter process, it returns to its former length by annealing.

"Again, wires of certain different metals, after passing through the same hole in the wire-drawing plate, have different diameters; but all such subsequently acquire equal diameters during the process of annealing. The diameter of a wire is said to increase very slowly by time, after passing through a wire-drawing plate. Wires which have been bent, and subsequently straightened, have a tendency to reacquire the same curvature by time.

"Wires exposed to a high heat lose part of their tenacity. They require to be annealed in wire-drawing, not to render them more tenacious, but to allow the particles to resume the positions from which they may again be displaced.

"The loss of tenacity is common to copper, iron, platinum, and the alloys of copper and zinc.

"Hydrogen has an action on copper and silver, at high temperatures, which permanently separates their particles. On alloys of copper and zinc, and even of silver and copper, it has no such action.

"Brass wire approaches to iron in strength, while copper wire is much inferior to it; hence, brass is much used instead of iron where the latter would oxidize too rapidly.

"Iron wire is made of different qualities, to stand a strain from 75,000 up to 130,000 pounds to the square inch. The tenacity of brass wire varies from 78,000 to 87,000 pounds to the square inch; while copper wire will part at from 38,000 to 44,000 pounds.

"These facts, with many others of a like character, have been carefully arrived at by many and most elaborate experiments, and a knowledge of them is valuable to every mechanic."—(*Druggists' Circular and Chemical Gazette.*)

—
Gold Leaf Decolored.—"The green color of gold leaf when seen by transmitted light may be destroyed by subjecting the metal, extended on glass or mica, to heat, a temperature as low as that of boiling oil being sufficient, if continued for several hours. When pressure is applied to such discolored gold by a convex piece of crystal of short radius, the green color of the transmitted ray reappears."—(*Sci. Amer.*)

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, MARCH, 1866.

No. 8.

ORIGINAL COMMUNICATIONS.

NUTRITION.

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(Continued from page 338.)

UNDER the influence of *vital force*—which in the preceding communication was found to be correlated with physical forces, all of which are but modifications or varying forms of that protean force which, coming from the sun, as the great centre of the solar system, as heat, and leaving us as heat, develops between its entrance and departure the multiform powers and resources of our globe—living bodies manifest the peculiar property of forming themselves out of materials dissimilar to them, as when the plant absorbs from the earth and surrounding atmosphere, the oxygen, hydrogen, nitrogen, carbon, salts, etc. which enter into the composition of its structure, or the animal feeding upon the vegetable obtains the material which shall go toward the formation of the various fluids and solids or tissues of its organism.

All living, or *organized* bodies—that is, bodies composed of different parts or *organs*, each of which has a distinct function to perform—obtaining as they do their materials from the inorganic world, are capable of being resolved into the *inorganic* simple elements by chemical analysis, but the number which may be obtained from this source only comprise about seventeen, out of the sixty-five elements which enter into the composition of the universe: these are oxygen, hydrogen, nitrogen, carbon, sulphur, phosphorus, chlorine, sodium, potassium, calcium, magnesium, silicon, aluminium, iron, manganese, iodine, and bromine.

The power of self-formation from dissimilar materials referred to as peculiar to living bodies, manifests itself under three different stages, viz., *development*, *growth*, and *maintenance*, which have been so clearly

and fully defined by Paget, that one cannot do better than quote his language in elucidation of these terms.

"*Development* is the process by which each tissue or organ of a living body is first formed; or by which one, being already incompletely formed, is so changed in shape and composition as to be fitted for a function of a higher kind; or, finally, is advanced to the state in which it exists, in the most perfect condition of the species."

"*Growth*, which commonly concurs with development and continues after it, is, properly, mere increase of a part, by the insertion or super-addition of materials similar to those of which it already consists. In growth properly so called, no change of form or composition occurs: parts only increase in weight, and usually in size; and if they acquire more power, it is only more power of the same kind as that which they before enjoyed."

"In *Assimilation* or *self-maintenance*, living bodies preserve their condition notwithstanding the changes to which they are liable through the influence of external forces and their own natural decay; and the stability of composition which they thus display is effected by the continual formation of new particles in the place of those which are impaired and removed."

In the development and growth of the various tissues, the active agents are cells previously existing in a fluid called blastema, and in assimilation or nutrition the end is also attained by and with the continued energy of the cells; the materials of the nutritive process being present in the blood, each tissue and organ, through these cells, attracts the particles from it. Nutrition, however, does not consist merely in the component particles of the tissues attracting the fibrin, albumen, and other materials of the blood which flow through them, but the assimilating particles through cell agency, infuse into those newly added to them their own peculiar properties. Each *cell* that enters into the formation and nutrition of the different tissues is an independent organ having a definite period of existence, and lives for itself and by itself; and is dependent upon nothing but a due supply of nutriment and of the appropriate stimulant for the continuance of its growth, and for the due performance of its functions until its term of life has expired.

There are two prominent theories entertained by histologists with respect to the origin of cells, viz.: 1. That in which it is assumed that they arise *de novo*, or spontaneously, from a structureless fluid or *cytoblastema*. 2. That in which it is asserted that "where a cell arises there a cell must have previously existed (*omnis cellula e cellula*)," and that the *blastema*, *cytoblastema*, *plasma*, or by whatever other names the fluid may be called in which cells are found, is not a structureless fluid out of which they are formed *spontaneously*, but that every cell found there was formed by a pre-existing cell, and is in turn capable of reproducing its

like. In other words, that each cell is born, lives, reproduces its kind, and dies. The *first* theory is in accordance with the idea of the *spontaneous generation* of plants and animals. The *second*, harmonizes with the generally recognized fact that all *organized* bodies have their origin in an *egg* or *seed*, and that there appears to be no exception to the universality of the maxim of Harvey—*Omne vivum ex ovo*.

The cells which are thus found to be not only the active agents in the formation of each other, and of the tissue and organs, are vesicles composed of membranous cell-walls, usually with liquid contents, whose normal shape is spheroidal or oval, although they may eventually assume a scale-like form as in the epidermis and tessellated epithelium, or by mutual pressure they may become many-sided as in the hexagonal enamel fibres. Within each cell there is found a body called a *nucleus* that contains a number of *granules* or *molecules*, which are the simplest and minutest of the primary forms of organized substances.

(To be continued.)

RULES FOR ALLOYING GOLD.

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IN this article I shall not discuss the effects produced upon gold by the different metals generally used in alloying, but merely lay before the reader a means by which he will be able to obtain an alloy of the desired standard, and also to ascertain the fineness of a given formula. Yet I cannot refrain from calling attention to one point; that is, whatever metal or combination of metals may be employed for alloying, it is of the utmost importance that the alloy should be thoroughly and uniformly incorporated with the gold.

In commercial phraseology, and by dentists and jewelers, the quality of gold is generally designated by the term *carat*. This term is used in this case to express the fineness, not weight. Thus, 24 carat gold is perfectly pure gold; 23 carat gold contains 23 parts of gold and 1 part of alloy; and 18 carat gold, 18 of gold and 6 of alloy.

A more scientific method, the one adopted in our Mints, is to rate the fineness of gold by expressing the proportions in thousandths.

Thus, the standard of American gold (in 1837 and since) is 900 thousandths; meaning that in every thousand parts of coin there are 900 parts of pure gold and 100 of alloy.

When we have the purity of the alloy expressed in thousandths, we can readily ascertain its carat, and *vice versa*.

Thus, for example, if we desire to find the carat of the American gold coin, which is 900 thousandths fine, the statement is made in this manner:

1000 : 900 :: 24 : 21.6, the required carat.

Or, having the fineness of an alloy expressed in carats, we desire to reduce it to thousandths.

Take for instance the American coin 21·6 fine; to reduce it to thousandths, the statement is thus made :

$$24 : 21·6 :: 1000 : 900, \text{ the number of parts of pure gold in one thousand of the alloy.}$$

Or, again, if we have the weight of an alloy, and its fineness is expressed in thousandths, we can readily find the quantity of pure gold in the mass.

For example, to find the amount of pure gold in an American Eagle,—weight 258 grains, fineness 900 thousandths,—the statement is made thus:

$$1000 : 900 :: 258 : 232·2 \text{ grains, the amount of pure gold contained in this coin.}$$

Rules for Alloying, etc., the purity of the Gold expressed by Carats.

1. When the carat is known, to ascertain the quantity of pure gold in the mass.

RULE.—Multiply the weight of the mass by the carat, and divide the product by 24.

Or, let c represent the carat.

“ w “ “ weight.

$$\text{Formula, } \frac{w \times c}{24} = \text{quantity of pure gold.}$$

EXAMPLE 1.—To find the quantity of pure gold in 156 grains of an alloy 19 carats fine.

By the formula we shall have

$$\frac{156 \times 19}{24} = \frac{2964}{24} = 123\frac{1}{2} \text{ grains of pure gold.}$$

EXAMPLE 2.—To find the quantity of pure gold in 258 grains of 21·6 carat gold (an American Eagle).

$$\frac{258 \times 21·6}{24} = \frac{5572·8}{24} = 232·2 \text{ grains, the amount of pure gold in an American Eagle.}$$

2. To ascertain the carat of a formula for an alloy composed of gold of a known carat and an alloy containing no gold.

RULE.—Multiply the weight of gold by its own carat, and divide the product by the weight of the mass.

Or, let a represent the weight of gold.

“ c “ its carat.

“ w “ the weight of the mass.

Formula, $\frac{a \times c}{w} = \text{carat of the mass.}$

EXAMPLE 1.—To find the carat of the following formula composed of pure gold and alloy containing no gold.

Pure gold (24 carat).....	80 grains.
“ silver.....	10 “
“ copper.....	20 “
	<hr/>
weighing.....	110 grains.

By the formula,

$$\frac{80 \times 24}{110} = \frac{1920}{110} = 17.45 \text{ the carat of the mass.}$$

EXAMPLE 2.—To find the carat of the following formula composed of alloyed gold and an alloy containing no gold.

22 carat gold.....	48 grains.
silver.....	16 “
copper.....	12 “
	<hr/>
weighing.....	76 grains.

By the formula,

$$\frac{48 \times 22}{76} = \frac{1056}{76} = 13.89 \text{ the carat of the mass.}$$

3. To find the carat of a mass composed of different qualities of gold, the carat and weight of each quality being known.

RULE.—Multiply the weight of each quality by its own carat, and divide the amount of the products by the weight of the whole mass.

EXAMPLE.—To find the carat of a mass of gold composed of 10 ounces of 20 carat gold, 15 ounces of 12 carat, and 20 ounces of 10 carat.

$$\begin{array}{r} 10 \times 20 = 200 \\ 15 \times 12 = 180 \\ 20 \times 10 = 200 \\ \hline \text{Weight, 45 ounces. } 580 \\ \hline \frac{580}{45} = 12.88 \text{ the carat of mass.} \end{array}$$

4. To reduce gold to a lower carat by adding an alloy containing no gold.

RULE.—Deduct the required carat from the carat to be lowered, then divide the remainder by the required carat; the quotient multiplied by the weight of gold to be reduced will give the quantity of alloy to be added.

Or, let a represent the carat to be lowered.

" b " " required carat.

" w " " weight of gold.

Formula, $\frac{a-b}{b} \times w = \text{weight of alloy.}$

EXAMPLE 1.—To reduce 200 grains of pure gold (24 c.) to 18 carat.

By the formula,

$$\frac{24-18}{18} \times 200 = \frac{6}{18} \times 200 = \frac{1200}{18} = 66.6 \text{ grains of alloy}$$

to be added.

EXAMPLE 2.—To reduce 258 grains of 21.6 carat gold (an American Eagle) to 18 carats.

By the formula,

$$\frac{21.6-18}{18} \times 258 = \frac{3.6}{18} \times 258 = \frac{928.8}{18} = 51.6 \text{ grains of}$$

alloy must be added.

5. To reduce gold to a lower carat by adding to it an alloy of gold of a standard lower than the desired carat.

RULE.—Subtract the required carat from the carat to be lowered, divide the remainder by the difference between the required carat and the carat of the coarser alloy; then multiply the quotient by the weight, and it will give the weight of the coarser alloy to be added.

Or, let a represent the carat to be lowered.

" b " " required carat.

" c " " carat of coarser alloy.

" w " " weight of gold to be reduced.

Formula, $\frac{a-b}{b-c} \times w = \text{weight of coarser alloy.}$

EXAMPLE 1.—To reduce 4 ounces of pure gold (24 c.) to 18 carat by adding 12 carat gold.

By the formula,

$$\frac{24-18}{18-12} \times 4 = \frac{6}{6} \times 4 = 4, \text{ the number of ounces of 12}$$

carat gold that must be added.

EXAMPLE 2.—To reduce 4 ounces of 22 carat gold to 18 carat, by adding 12 carat gold.

By the formula,

$$\frac{22-18}{18-12} \times 4 = \frac{4}{6} \times 4 = \frac{16}{6} = 2 \text{ oz. 5 drs. 20 grs. of 12}$$

carat to be added.

6. To raise the carat of an alloy by adding pure gold or a finer alloy.

RULE.—Deduct the carat to be raised from the required carat, and divide the remainder by the difference between the required carat and the carat of pure gold (24) or that of the finer alloy (whichever is used), and then multiply the quotient by the weight, and it will give the weight of pure gold or finer alloy to be added.

Or, let a represent the carat of pure gold or finer alloy.

" b " " required carat.

" c " " carat to be raised.

" w " " weight of alloy to be raised.

Formula, $\frac{b-c}{a-b} \times w =$ weight of pure gold or finer alloy.

EXAMPLE 1.—To raise 240 grains of 15 carat gold to 20 carats by adding pure gold (24 c.).

By the formula,

$$\frac{20-15}{24-20} \times 240 = \frac{5}{4} \times 240 = \frac{1200}{4} = 300 \text{ grains of pure gold to be added.}$$

EXAMPLE 2.—To raise 45 ounces of 12.88 carat gold (see rule 3) to 18 carat by adding gold of 21.6 carat (U. S. coin).

By the formula,

$$\frac{18-12.88}{21.6-18} \times 45 = \frac{5.12}{3.6} \times 45 = \frac{230.40}{3.6} = 64, \text{ the number of ounces of coin to be added.}$$

I have been induced to give the foregoing rules for alloying gold, as they are more comprehensive than any that have been offered to the profession; and believing that many who melt their gold, from the want of a correct knowledge upon this subject, insert plates of a quality far inferior to what they would otherwise do.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from p. 346.)

The Epulides.

EPULIS. The derivation of this word is from the Greek *επι οίλον*, signifying "upon the gum."

It is applied by a common consent, or rather, I should say, is meant to be applied to a class of tumors having origin from the alveo-dental periosteum.

In the study of these tumors, every one, I presume, has felt himself more or less confused and confounded. It would, indeed, be surprising, if such should not be the case, considering the diversities in description by various writers. And yet these discrepancies, numerous as they are, may be, I think, easily explained away.

First. I will take it on myself to say, that the term *Epulis*, when used pathologically, is entirely without meaning or expression, and, as a noun substantive, should at once be discarded from surgical nomenclature. There is no special disease which can be called *Epulis*, and called so with a distinctive meaning. Let me illustrate: Salivary calculi rest upon the gum (*επι οίλου*) upon the gum. Is not therefore a calculus an *Epulis*?

The term is inadequate in expression, used as a noun, and must ever remain so, because, from the alveoli of the teeth, grow tumors of various signification. Thus, we have fibroid, the fibro-recurring, the myeloid, the polypoid, the encephaloid or carcinomatous, the simple pulp fungoid, etc. etc. Hence the confusion which marks the writings of nearly all authors on the subject, each, without prefatory explanation, describing the various growths under the one common head. Take even Mr. Ferguson, so eminent as an oral surgeon, for example: "*Epulis*," he tells us, "is a disease which begins as a small spot on either the outer or inner surface of the gums." Again, he says: "*Epulis* consists of a swelling of solid bone, the hard parts of the bone being primarily affected." Again: "*Epulis* is an osseous cyst, containing a glairy or a serous fluid." He also instances what I would recognize as a common polypus, and calls it too, an *Epulis*.

Mr. Paget, on the contrary, going to the other extreme, seems to ignore the existence of *Epulis*. Let the student turn to his history of the myeloid diseases, and see how he treats our *επι οίλου*.

Ask the first medical friend you meet what he understands by an *Epulic* tumor, and the chances are, as nine to ten, that he will say to you, "it is a malignant tumor about the gum." Ask then your next friend, and most likely he will offer to prove by the microscope, that such growths are benign; and it may be that he will bring you specimen after specimen in proof of his assertion.

I have studied this subject long and closely; I think I may lay claim to being familiar with most authors who have written in the direction, and I have satisfied myself that all the various discrepancies are only seeming and not real; and that all differences are to be reconciled simply by the abnegation of the word *Epulis*, as a noun substantive, using it only as an adjectual noun. Let me illustrate: Suppose the spot upon the gum to which Mr. Ferguson alludes, should be of the character of epithelioma, then, pathologically speaking, it would be cancer; but, being situated upon the gum, *επι οίλου*, it would also be *Epulis*. Take the bony tumors (evidently osteo-sarcomatous, as in our classification we

are hereafter to study them), wait until their growth shall extend so as to emerge from the gums, they will still remain sarcomatous, but they will also have become Epulic.

So also the myeloid tumors instanced by Mr. Paget as being mistaken for the Epulides; being upon the gums must necessarily have been true Epulides, and the men who disagreed with Mr. Paget, calling them by such names were right—right in a sense. Yet also was Mr. Paget right.

The one class called them Epulis, because they were situated upon the gums, and it was their creed so to call all tumors so situated. The other, more learned, perhaps, designated the growths pathologically; the tumors were marrow-like, the situation of them was of no consequence. Now, let us see how easy it would seem to be to reconcile these different descriptions of one and the same disease. Suppose we drop the word Epulis, as a noun substantive, as a term having pathological meaning, and apply it in accordance with its anatomical derivation. The tumors were myeloid, they were situated upon the gums—we will call them “Epulo-myeloid;” is not the difference here reconciled, and is not the hyphen solidly expressive? An Epulo-myeloid growth is a tumor situated upon the gums, marrow-like in pathological character. Here is expressed at once, and happily, as it seems to me, location and character.

If the reader is prepared, from the argument, to accept of the change proposed, all confusion will be found to have disappeared. We have no longer any tumor of the mouth which we know as an “Epulis;” but we have Epulo-myeloid, Epulo-fibroid, Epulo-fibro-recurring, Epulo-carcinoma, or whatever other class of tumor pathologically may present itself to us situated upon the gums. By such change in nomenclature, we make this *pons asinorum* an easily-crossed bridge; we create a term as patent to the scholar, and as expressive as are the hyphens Gastr-algia, Cephal-algia, Gastr-itis, Cerebr-itis, etc.

History of a few Cases Illustrative of Practice in this Direction.

CASE I.—Some four years back, Mrs. T., the sister of a medical friend, was brought by the brother to my office for consultation on a tumor (about the size of an ordinary pea) growing from the alveolus of an upper molar tooth. I thought this tumor belonged to the class pulp-fungoid. There was the broken palatine fang in the jaw, but so deep as to be only fairly discernible to the probe; I could not see the origin of the growth, but inferred its character; by separating carefully the alveolus from the fang, I was enabled, after some little trouble, to get the root from its bed. The little tumor proved to be an outgrowth of the periodontal membrane, and not an excrescence from the pulp; in character it was distinctly and decidedly fibrous—it was then an Epulo-fibroid tumor. It did not look like a growth from the periosteum, but rather as if its origin was in the crusta-petrosa, and it had carried the periosteum before it somewhat like the infundibuliform fascia is made a tunic to the descending intestine in an

oblique inguinal hernia. The removal of the fang brought the growth cleanly away; of course, no scraping or cutting of the parts was at all necessary; the growth was evidently an emanation of the dental aspect of the periosteum, and had in no way involved its alveolar reflection. No treatment of any kind outside of the removal of the tooth was employed; the patient remains perfectly cured.

CASE II.—Mrs. Jumelle, wife of Mr. Jumelle, of this city, well known from his connection with a somewhat celebrated pulmonic syrup, presented herself some time in 1862, with a livid, threatening-looking tumor the size of a hickory-nut, occupying the left alveolar face of the upper jaw, extending from the lateral incisor back to the tuberosity. This tumor diminished in size during sleep, and increased during the time of any excitement which tended to accelerate the circulation, sometimes seeming like a solid body, at others, like a spongy mass; it evidently was erectile in its nature, analogous to the ordinary nævi. It was an Epulo-erectile tumor.

Separating the growth from the gum, its association with the periosteum was plainly evident; while the probe revealed extensive caries of the neighboring bone. An operation, which resulted in complete cure, was performed as follows: The lip being held well out of the way by an assistant, an incision was made, extending from the central incisor tooth of the affected side back to the tuberosity, and a similar cut carried back on the palatine face of the tumor to the place of beginning; this cut was made freely through the soft parts down to the bone, and completely circumscribed the tumor, with a reasonable margin to spare. The central incisor was next extracted, and, with the ordinary cutting-forceps, a cut was made through its alveolus, extending almost to the labio-nasal angle. A second pair of cutting-forceps was now taken up, and by two cuts the width of its blades, the involved bone was removed; the section extending, as is evident, from the situation of the left central incisor to the tuberosity. The specimen is in the museum of the Philadelphia Dental College. Considerable hæmorrhage attended this operation, although the section was well outside of the vessels involved, three ligatures being required.

After-Treatment.—The lady being of very full habit and of markedly sanguine temperament, magnesia sulph. ʒss was ordered the evening of the operation. As an opiate, morph. sulph. gr. ss.

Day after Operation.—Marked inflammatory action, attended with considerable swelling of the tissues of the face.

R.—Plumbi acet. ʒij;

Tinct. opii, ʒij;

Aqua, ʒxvi.

Ordered a cloth wet with the preparation to be kept continuously upon the face.

Third Day.—Inflammation increasing; eyes completely closed from the great oedema of the lids; mag. sulph. reordered, with hot pediluvia; eyelids heavily painted with tinct. iodine.

Fourth Day.—Erysipelas set in; the face looking like a glistening red ball; patient restless, nervous and frightened; painted the whole face with tinct. iodine, officinal strength; the lead-water and laudanum continued; iron and quinine internally.

R.—Tinc. ferri chl. ℥iij;

Quinia sulph. grs. xxv.

Sig.—15 drops in water every three hours.

Also a diaphoretic.

R.—Liq. ammoniac acetatis, ℥ij.

Sig.—Tablespoonful every ten minutes until profuse perspiration is induced.

Sixth Day.—Erysipelas evidently yielding; iron and quinine; painting with iodine and lead-water, and laudanum continued.

Seventh Day.—Much improved; the erysipelatous redness all gone; skin wrinkling; patient can see a little from one eye; continued the painting with the iodine and lead-water lotion.

Ninth Day.—Inflammation all gone; patient quite comfortable; the exposed bone covered with a thin layer of healthy granulations; case progressing well.

Twelfth Day.—Patient attending to household duties; mouth, of course, very tender, but advancing toward a cure rapidly.

Twenty-fifth Day.—Patient may be called well; needs no further attention.

To complete the case, artificial teeth have been inserted, the plate being made to fill up the place of the lost bone. No one would ever suppose in looking at the lady she had lost such a portion of the jaw.

CASE III.—Mrs. S., of Camden, N. J. Epulo-fibroid tumor of left superior maxilla. This tumor was the size of a large walnut, the bulging of the cheek from its presence quite deforming the patient—growing very rapidly, painless. Patient had been confined with her fourth child five weeks before presenting herself.

Operation.—This was performed three weeks later, the infant being eight weeks old. The tumor, or all that portion of it which was dissiminated with the bone was cleanly removed with the scalpel, together with a margin of surrounding healthy tissue. This step exposed the bone, which was found carious and in a honey-comb condition. This was to be removed, and which was easily and happily effected through the use of the gouge, little by little being cut away until healthy structure was exposed. The surgeon recognizes such healthy structure both by its feel under the instrument, and its appearance; healthy living bone being white, studded with minute bleeding points. Hæmorrhage during the

operation was considerable, but was controlled without ligature, simply by throwing alum water into the wound from an ordinary syringe.

After-Treatment.—Very little required; a wash of the permanganate of potash, five grains to the ounce of water, was given as a disinfectant, there being for a few days a somewhat disagreeable odor from a decomposing blood clot. No antiphlogistics, or systemic treatment of any kind was required, not a bad symptom having appeared, the patient being entirely well in three weeks from the day of operation. In this operation the floor of the antrum was removed and the cavity wholly exposed. At the completion of the cure, it was, however, closed up, as in its normal condition.

CASE IV.—Mrs. T., West Chestnut Street. Tumor of four years' growth; loosely fibrous in structure, occupying one-half of the roof of the mouth, giving a most disgusting and threatening appearance. The growth had first appeared between the bicuspid and first molar teeth, and at the time of my first seeing it, had entirely destroyed the inner alveolar plate of all the portion of the jaw with which it was associated. In raising the tumor from its bed, all the underlying palatine process, as far as could be seen, was also found to be diseased.

Operation.—This consisted in cutting away as much of the growth with the scalpel as possible, and completing the operation on the bone with the gouge. Hæmorrhage very profuse, the use of a compress being necessary for its arrestation; and this only effected after several hours.*

After-Treatment.—Very little required; some overinflammatory action, but which quickly and readily yielded to low diet for a few days, and a single dose of sulphate of magnesia. In three weeks the case was in condition to be dismissed.

CASE V.—Mrs. C., colored. Epulo-fibro-recurring tumor of upper jaw, had been twice imperfectly removed by her physicians; the osseous structure in neither instances being included in the operation. Tumor the size of a small orange, and involving the whole antrum of the affected side. Proposed the removal of the whole maxilla, the only operation which I conceived promised any permanent relief. The operation was objected to by the patient.

History of Case.—Day by day the tumor increased in volume; soon the floor of the orbit was thrown up and the eye protruded out on the cheek; a short time longer and the growth passed into the cranial cavity, destroying the patient.

(To be continued.)

* Hæmorrhage sometimes attend these operations where the ligature cannot be applied, and where it is not expedient to employ measures which are apt to be attended with secondary bleedings, as, for example, the actual cautery.

DENTAL MATERIALS.

BY J. CARROLL HOUSE, D.D.S., LOWVILLE, N. Y.

(Continued from p. 360.)

Of the fibrous gypsum or satin spar, considerable use was at one time made in the manufacture of ornaments and beads known as *Roman pearls*.

But among the arts and in science, the most importance by far is attached to that variety known as the white amorphous gypsum, or better known as *plaster of Paris*. The latter name being derived from the fact of this substance being found in considerable abundance at Montmaitre, in the vicinity of Paris, France, where it was originally used as an ingredient of stucco, and for plastering, being mixed with quicklime; though that its use in stucco was well known to the ancient Greeks, we are made certain by the writings of Theophrastus and others, who tell us that it was so used in conjunction with one-third of carbonate of lime. From being first used in mortar as a plastering for dwellings, etc., the discovery was next added which is the ground-work of all its after usefulness; it being found that when "the purer varieties of the white gypsum were *calcined* and *pulverized*, if then it was mixed with water to a consistency of thin cream, it could be made to copy works of art, such as medals, small statuettes, etc., reproducing most perfectly the very minute lines, which was accomplished through the hardening of the mixture used, until it resembled marble or stone."—(*Rees*.) From its first employment, its usefulness has been constantly extending itself into very many of the branches of ornamental and practical art, until at the present time the name of "plaster of Paris" is synonymous with an article which holds no small place in the commerce of the world. "Calcined plaster," as it is called, is now manufactured upon an extended scale in various parts of our country. I have only space to describe one or two of the processes.

It is customary for some manufacturers to first crush or break the native gypsum, selecting a good quality of the white amorphous, into lumps the size of butternuts, and then finely pulverize it by passing it through a small pair of burr-stones set in a similar manner to the stones of a flouring-mill. In this manner the gypsum is very finely comminuted. It is then put into a large close iron boiler or heater, beneath which is a steady coal fire sufficient to raise the mass in the heater to a little over 300° Fahr. (some say 400°). The pulverized gypsum being kept constantly stirred by a rotating dasher, which is continually revolving within the heater; this, in addition to the ebullition produced by the escape of watery vapor from the gypsum itself, keeps the whole mass in a lively state of agitation. The process is continued until nearly all of the twenty per cent. of water of crystallization is expelled; when the mass is allowed to cool, removed from the heater, and put into tight barrels lined with paper, when it is ready for the market.

Other manufacturers calcine the gypsum just as it comes from the quarry, in kilns similar in character to the common lime-kiln, by which they expel the water of crystallization from the rock, after which it is pulverized as above, and thus made ready for use.

Experience has proven the former method to afford the best plaster; perhaps in the latter there is danger of overheating the gypsum, and thus changing its chemical arrangement of atoms.

In the practical use of calcined plaster, it is found that there is a great lack of uniformity in the time requisite for various grades or makes of the article in the process of setting, as it is termed, or recrystallization; and this lack is oftentimes of great inconvenience, particularly to the practitioner of dentistry. This may arise from overcalcination, or burning of the plaster; or it may have its explanation in the neglect of the manufacturer to drive off the moisture; or thirdly, it may have been once properly prepared, but by exposure to the atmosphere has deteriorated by absorbing moisture therefrom. To tell good plaster—that which has been calcined properly—take a saucer partly full of water, and carefully sift into it a lot of the plaster from the end of a knife or scoop, but not enough to take up all the water; drain off all the excess, and if the plaster is good, in less than *one minute* you can *pile* up the mixed plaster with your spatula; whereas, if the plaster is not properly prepared, or is old, it will take some minutes before it can be so treated. Again, when the scoop or spatula is thrust into the calcined plaster, it will, if good, give a very peculiar feeling to the hand, quite similar to thrusting it into a mass of fine sharp sand; whereas, if the plaster is old, it will feel more like wheat flour. This last test can only be obtained by experience in the use of it. A fourth reason for the difference in the setting of plaster is due to the varying degrees of fineness of the article as found in market, for we find, when we take into consideration the chemical laws which control crystallization, that, other things being favorable, that arrangement of elements which go to constitute a basic salt which are in the nearest possible contact will the more readily yield to those laws which direct its peculiar crystallization; which being true, it of course would be apparent that if we would have plaster resume as nearly as possible its pristine qualities of hardness, etc., it is necessary that we have it reduced to a state of *atomic division*; this, of course, is practically an impossibility. The best therefore which we can do is to make it an impalpable powder. For many of the purposes of the arts, this is not absolutely necessary; but for the dentist it is quite worth *his* attention who aims at *perfection*, and it will be observed from the above processes of manufacture, that the calcined plaster of commerce does not reach him in just the most favorable condition for its use. It becomes, therefore, a decided question of practicality with him as to how the desideratum shall be attained. The practical mind at once says “sift it!”

but how? Just try the plan on a small scale, and, with the utmost caution, you will find your clothes and everything in your immediate vicinity covered with a deposit of white dust; and then, too, were dentists to sift their plaster by hand, I fear that it would be a task not often attempted when once tried.

There is an article lately offered to the profession, purporting to be extra fine, and it truly is a great advance upon the ordinary commercial commodity. But even this can be greatly improved, so that the dentist may obtain by its use a very fine, hard, smooth and exceedingly sharp impression or model. This I have been enabled at last to accomplish, after repeated failures, by the use of a piece of mechanism, of which the following is a brief description.

A couple of circular disks of wood, 15 inches in diameter and $\frac{1}{2}$ inch thick, are mounted upon an arbor, $6\frac{1}{2}$ inches apart. Around the periphery of these disks, eight slats are arranged at equal distances, being let in flush with the circumference, and their inner edges facing the arbor, beveled each way outward. Around the outside of this open drum, and covering seven of the eight spaces, is firmly stretched a piece of superfine miller's bolting cloth (heavy muslin might do for economy) of No. 9 grade, about 80 meshes to the lineal inch. The eighth space is filled with a thin board, through which there is an oval aperture $5\frac{1}{2}$ inches long by $3\frac{1}{2}$ wide. This opening is closed by a tightly-fitting sheet-tin slide conforming in convexity to the arc of the drum. An octagon case of half-inch wood, made with an open top to close like a box and with an inclined bottom shooting forward, is mounted firmly upon four legs, with an internal dimension just sufficient to allow the drum to rotate freely upon its arbor, which rests in journals on each side of the case. Externally to the case, and snug against the sides of the same, are secured upon each end of the arbor a couple of lug-wheels, which rest upon the lugs. Upon the outer extremity of the arbor is fastened the crank by which the drum is made to revolve within the case; at the bottom of the latter there is an opening closed by a slide.

The operation of the apparatus is simple. When we wish to screen a lot of plaster, the slide is withdrawn, and a quart or two of plaster poured into the drum, the slide is replaced, the cover shut down over the drum and made secure by a hook at the right-hand side; and with a hand holding the crank lightly, the drum is slowly rotated within the case. As the notches in the lug-wheels, in turning, pass the lugs, a sharp jar is constantly being imparted to the drum and its contents of plaster, which jar shakes a portion of the latter through the meshes of the cloth, which falls to the bottom of the case. It will require but a few rotations of the drum to screen out all the finer particles, when a new lot can be placed in the same and the operation repeated. The coarser portions remaining behind in the drum can be removed by lifting out the

same from the case, taking out the slide and pouring the contents into a proper receptacle. The fine plaster can be withdrawn through the opening.

By the use of this piece of mechanism, a person will be surprised at the amount of debris which is to be found in even the best prepared plaster. On an average not more than two-thirds or three-fourths of the plaster will pass through a cloth of the number above mentioned, and a dentist who has tried plaster so prepared, will very reluctantly return to the old article.

For the common purposes of the arts, the working of plaster of Paris is very simple. Take any vessel which will hold a sufficient amount for the purpose, and fill it partially with clear water. Into this slowly sift or pour the calcined plaster until the surface of the submerged plaster is nearly even with the water; then pour off the surplus water and stir with a spatula, made of wood or iron, until the whole is thoroughly incorporated, and it is ready for the mould or impression cup.

Many dentists make use of a weak brine of common salt and water, with which to mix their plaster for taking impressions of the jaw, and if the plaster is not thoroughly screened it is rather necessary; but with well-sifted fresh plaster, the brine is no improvement, and is not so pleasant.

When it is desirable to make a harder, firmer composition than simple plaster affords, it can be accomplished by using a solution of alum, or of isinglass or gelatine, and if a mixture of from two to five per cent. of alum, sulphate of potash and borax, be added to the water before stirring in the plaster, the object produced will be quite hard and susceptible of receiving a polish.

There is a species of colored marble artificially produced under the name of "*Scagliola*," which consists of a mixture of isinglass, alum, and plaster of Paris, colored by the addition of suitable materials, and cast in moulds of requisite pattern. The stucco ordinarily made use of at the present day is obtained by mixing plaster with a strong solution of glue, to which is sometimes added, for ornaments, from ten to twenty per cent. of paper pulp. The latter prevents the easy fracture of any of the more delicate parts.

Pure plaster of Paris ornaments, busts, casts, etc. can be made to resemble marble, by dipping them, after being thoroughly dried, into the following preparation: To four pounds of clear water, add one ounce of pure curd soap, and the same quantity of white wax finely grated. Put the vessel containing them over a low fire, until the soap and wax are thoroughly incorporated, then set aside to cool. If into the above the plaster be twice dipped, and set aside for a week protected from the dust, it can then be lightly rubbed over with some soft muslin, raw cotton, or wool, when it will have the gloss and appearance very much resembling marble.

In the working of plaster it is often requisite to make the article or

mould in two or more sections, as when a copy is to be made of any work of art or in the manufacture of the matrix or mould for the vulcanite base for artificial dentures. In such cases, the first or base portion is first made and allowed to set and partially dry, when the surfaces of this portion which are to receive the next addition of plaster (and which latter is to be kept from adhering to the first) are made as smooth as convenient and coated with a film of shellac varnish, which, when dry, is brushed over with sweet oil, and the next portion of plaster added, which, when properly hardened, can easily be separated from the first portion. The dentist in active practice who uses the vulcanite base for his plates, finds that the item of *varnish* is of some importance; with alcohol at six dollars per gallon, and I have found that the preparation which I have given above of curd soap and white wax when made rather stronger than there given, answers the double purpose, supplying the place of both varnish and oil, and permitting the two halves of the matrix to be readily separated for the removal of the model plate of gutta-percha or wax. It may also be used to coat plaster impressions before pouring in the plaster for the model.

Plaster is sometimes used for making moulds in which to cast various articles from the softer and more fusible metals and their alloys; but to be successful, it must be worked with much care, for the thorough drying to which the plaster must be subjected before pouring in the molten metal, destroys, in some degree, the integrity of the mould, and injures its sharpness.

The tendency of plaster to crack and crumble when used for these purposes or for an investiture for dental plates when they are to be subjected to the heat of the blow-pipe, can be greatly obviated by mixing about thirty per cent. of coarse *silex* or flocculent *asbestos* with it, before adding the water. The asbestos is much the better of the two, as its long shreds or fibres serve to bind the mass together, as animals' hair does in the plaster of ceilings.

In the manufacture of metal base plates for full upper dentures, it is customary with some dentists to obtain the male die for striking up such plates by pouring the melted zinc directly upon or into the plaster impression; but the disposition of the plaster to shrink and open in fissures by the heat necessary to thoroughly prepare it for the melted metal is a very important obstacle to this mode of procedure. Various plans have been adopted to overcome the trouble, but perhaps I may not be considered egotistical in referring to a plan which was first proposed by me in a graduating thesis presented to the faculty of the Baltimore College of Dental Surgery, and by their recommendation was published in the *American Journal of Dental Science* for April, 1860, by which the change that would be made in the surface dimensions of the impression is corrected by making use of a very fine brass wire gauze, partially con-

forming to the contour of the jaw, which is placed in the impression cup, before the plaster is poured in, previous to its insertion in the mouth. When such an impression is heated, to a degree sufficient to prevent blubbing upon pouring on the melted zinc, the surface will be found, upon close inspection, to present an infinite number of very minute cracks, yet the general appearance is unchanged, and the zinc die obtained therefrom is as smooth as can be wished. (For more definite and fuller directions to those who may wish them, I would refer to the article alluded to, but which my present limits will not admit of making further extracts from.)

Dr. Clark, of Savannah (I think), has proposed a mixture of plaster and fine siliceous as a material for impressions, and has invented an apparatus for casting dies therefrom, which he highly recommends as producing a fine surface, and this without material shrinkage; but I have been unable to produce a mixture for this purpose that will harden in time short enough to admit of use in the mouth.

It would seem that as useful an article as the one which we have under consideration would have, at some time in its history, been the subject of some inventive ingenuity worthy of the indorsement of a United States patent, but a careful search for many years does not afford evidence that such is the case. While almost every conceivable composition has been the subject of patents, plaster of Paris remains still the same. I may possibly except those cases where it has entered into and been a composition with some others; as in those cases where it has been used with soapstone, burnt alum, magnesia, etc., as a filling for fire-proof safes and vaults.

Plaster works, casts, and ornaments, when they have become soiled by handling, or smoked, or soiled in any way, may be made to appear as good as new by brushing them over with common whiting mixed with a thin sizing made of picked white glue, dissolved in hot water; one or two coats with a light brush will be sufficient. When plaster is to be exposed to the weather, it should receive one or two good coats of oil paint laid on over the above sizing of glue, and then renewed every year.

Pulverized native gypsum, of the finer varieties, is somewhat used as an ingredient in the glazing of fine porcelain and the manufacture of artificial teeth.

I have thus far spoken of the rarer and finer varieties of gypsum, and it only remains for me to allude, in closing this article, to one or two uses to which the coarser, more impure, and more abundant varieties are applied. These are mostly the gray and blue gypsum.

When we examine the constituents of many of the grasses, as also those of turnips, potatoes, and many other of the vegetable or root crops, we find that we shall detect considerable sulphate of lime in them all. Therefore when a soil is deficient in this ingredient, it is found that these various crops cannot be produced in any perfection, and agricultural

chemistry calls for an addition of the lacking element in the form of a manure, either as a top-dressing for meadow lands or in the hill or furrow for root crops; and, as experiment has demonstrated its great usefulness for the above, vast quantities of the prepared plaster are annually consumed in the United States for manure—much of that used near the seaboard being imported from the quarries of Nova Scotia, while the immense beds of gypsum in Western New York and Virginia supply the inland demand.

When the impure varieties of plaster are mixed with sand and quicklime, it forms a fine and very useful hydraulic cement, much used for laying the substructures of piers, bridges, and the foundation walls of buildings, as also for plastering the inside of cisterns, aqueducts, reservoirs, etc. It is also the principal ingredient in the concrete used for making the floors of cellars. The material, while plastic, being spread upon the leveled earth, which forms the natural floor, soon hardens, and thus makes a fine smooth and dry floor, much preferable to wood.

SPONGE AND FIBROUS GOLD.

BY G. A. MILLS.

WHAT I propose to say in this article is in continuation of my former one.

I am aware that there are existing what seem to some practitioners to be serious objections to the use of *sponge gold*; and if these can be verified so as to make them general, I am willing to admit them.

I speak of the discoloration of the surface, resembling, as some have described it, *purple of Cassius*. I find, in conversation with some, that their verdict is decidedly against its use in any way. But I have noticed that this class do not prove to *my* mind that they are as close observers as they should be for their own good, or that of others with whom they come in contact. We should not give opinions based *alone* upon our own experience, for often the experience of others proves ours to be decidedly erroneous.

If my experience with an article bring me scarcely any good results, and there are shown to me directly opposite results by my brother in the profession, it is very evident that I am in the wrong. One great hinderance in our profession is a lack of charity for men and things. To show an instance in proof: the same dentist that comes out so strongly in opposition to sponge gold is daily in use of crystal foil, which, according to *my* observation and that of others, produces the same darkened surface, and in as many instances. It is said this effect is produced by an acid which is used in the preparation of *sponge gold*. I am not conversant with the method of preparation either of crystal or sponge gold. The first sponge gold which I ever used I helped to make. No acids were used; the only

chemical substance used was mercury. I have closely observed the appearance of fillings; for the last eight months more particularly. In order to be as well posted as possible on this point, I have conversed with several dentists who use it daily, and who are considered, by those who know them, as close observers, and standing A No. 1, and find their observations do not differ materially from mine. Now I do not wish to be understood by any that I am persisting so strongly in favor of the use of *sponge gold* from any *selfish motive*. I am after the "*golden truth*." I have heard such statements as this: *Hundreds of dollars* worth of fillings have been taken from one single mouth on account of this discoloration. I cannot deny the truth of this statement. All I can say is that the work of excellent operators who have used it for the last ten or twelve years does not show any such record. I have seen discoloration of gold fillings, particularly in the following localities: on the labial surfaces of the canines and incisors, and the anterior approximal surfaces of the first bicuspid. In some of the cases mentioned, I was not able to tell what preparation of gold was used. I have noticed this fact: where discoloration exists, there is an unhealthy condition of the saliva, what is termed a thick, ropy, or vitiated substance, exhaling an unpleasant odor. I trust this paper will call out such facts as may be existing, and thus the *truth* may be arrived at by experience and close observation. What is desired by the dental profession is the best article that can be produced. Let us be untiring in our efforts.

I am at this time giving my attention to a preparation of *gold* much resembling sponge, manufactured by Mr. Kearsing, of New York. It is called *fibrous* and *shredded gold*. It is claimed by him, I have been informed, to be free from any acid, as it is produced in a purely mechanical manner: first by being beaten so thin as to require to be blown from the case in which it is held; then taken *en masse* and subjected to a baking heat, making it brittle, so that it can be rubbed into an indefinite number of particles; then it is put into little pans of the desired size, and subjected to an annealing process. This increases the force of cohesive attraction, thus producing the desired density of the mass. It is capable of being manipulated very finely. Those who have been in the habit of using sponge gold will find it somewhat different, but it can be brought, I think, to a greater degree of density and with less labor. In using it, one is reminded of the effect produced by pressing the finger on damp snow; it is so bulky, and packs so easily, the wonder is what has become of it. A novel idea was made known to me by my friend, Dr. J. W. Lyons, of New York City, late of San Francisco; a method he had just been trying of preparing this fibrous gold, by cutting it with a razor into blocks of the size wished—not cutting down, but drawing the razor across the cake. I think a thin-bladed knife could be made that would answer the purpose much better. I have tried it and succeeded nicely; with

care, very little disturbance is made with the particles, not enough to do any harm. This gold is susceptible of a very fine finish. My impression is—from conversation had with dentists that have been using it for some weeks, and from my own experience—favorable. Mr. Kearsing prepared some months ago another article called shredded gold, which did not, as far as I can learn, prove to be very satisfactory; it was too hard. This is another preparation. If I were called upon to give it a name, I should call it *flake gold*.

Every dentist should take into consideration the comfort and accommodation of his patient as much as he can. Now, sponge or fibrous gold has a great claim in this direction. An operation consisting of filling a tooth, can be much shortened by the use of the above named articles. Taken fresh from the box, they are sufficiently adhesive (if not, it can be readily heated *en masse*, and the adhesiveness will be restored) to perform nearly all operations of filling presented to us; avoiding the necessity of putting each piece to the blaze as many do. Another claim they have—the difference of time required in preparation for filling. Foil must be divided into ribbons, blocks, pellets, cylinders, and ropes, etc. A great majority of operators bring the foil in direct contact with the *hands*, and I am certain no advantage is gained in its adhesive qualities; and allow me *here* to mention a very neat manner introduced by Dr. Smith, of New Haven, Connecticut, at the AMERICAN DENTAL ASSOCIATION at Chicago. It is simply cutting the foil into the desired width, and then carefully and dextrously rolling it between two napkins, not bringing it in contact with the hands at all. The manner of preparing foil in the various ways requires no little amount of time—certainly if $\frac{1}{16}$ or $\frac{1}{8}$ is used; and many times even more in these progressive days is not uncommon. And how often it is that the *operator* is not in a condition to readily and evenly prepare his gold, for the reason that he has unfitted himself by the preparation of the cavity, owing perhaps to the extreme difficulty of the position, condition, or by having a nervous or incompatible patient. I say the better course in such cases than to persist in the completion of the operation, is to dismiss the patient for rest and quiet, and a “harmonizing of the molecules.” But it is not done—*circumstances vary*. My experience teaches me that a large amount of time is saved by the use of sponge and fibrous gold, as compared with foil generally.

There is another advantage. I find a greater malleability and softness, more readily adapting itself to the location for which it was intended, and a less liability to choking, if I may use the expression. With foil this often occurs, and deceives the operator by leading him to think that there is a greater degree of density than there really is, and thus exposing the filling just at the part where strength is needed to make it secure.

If this paper shall lead to more experience and observation, and thus

establish more facts, and do away with unfounded suppositions, it will contribute its mite toward elevating the *ideal* of our profession. By careful study and earnest research to-day, we are educated beyond what our standard was yesterday.

P.S.—I have just at this point had my attention called to a case of discoloration. I was examining the teeth to see if anything required my services. I was asked what made this filling look so dark? For this lady I filled in last June to the amount of \$300, in many of the various localities that are most liable to be decayed. Here was a small filling upon the right approximal surface of the left lateral, exhibiting the discolored surface referred to in this paper, and not another discolored at all; and all the fillings were made of *Watts'* sponge gold. The condition of saliva that I have referred to exists in this case. *Who will crack the nut?*

BROOKLYN, N. Y., December, 1865.

THOROUGHNESS IN DENTAL OPERATIONS.

BY W. S. ELLIOTT, D.D.S., SAG HARBOR, N. Y.

THE rapid advancement in dental science is made evident to the observer by the differences between the standards of excellence on the part of one and another of those operators who pronounce each and every effort good. One may perform an operation which he himself would deem *only* good, and which another would pronounce excellent, yet the superlative praise bestowed would not enhance the quality of the performance, but would rather mark the standard set up for all cases which, though pronounced excellent, would only reach mediocrity; whereas the consciousness that each operation is *only* good, tends to that increased energy which at last ends in the accomplishment of really excellent results. The disparity is made more evident as the test of time is applied, for the one who satisfies himself in pronouncing his performances good, may, sooner or later, be called upon to rectify that which was evidently a shortcoming, either through ignorance or want of skill; and on the other hand, the *only* good is followed by that which is truly most excellent. The motive in the one case as in the other is doubtless an honest one—to do all that would seem to be required for the good of the patient; yet it is not always satisfactory to those who repose confidence in that professed skill which so often controverts the results.

The young student inserts a filling which his preceptor may pronounce excellent; and such it may be under the circumstance of his limited knowledge and experience. The measure of praise is not unduly extended, for comparison is made to a standard temporarily set which to the beginner will be at least appreciable. As knowledge is acquired and experience gained, the standard is raised, and that effort which was looked upon as especially meritorious, is now regarded as perhaps quite

defective in many essential particulars. Where the motive then is known to be unquestioned, the want of complete success is referable only to the want of knowledge of what is required in any given case; and he who assumes the practice of dentistry without that tuition which is capable of working up to the highest standard of excellence, will fall far short of what is required of him, and at the same time necessarily to the disparagement of his own interests.

How then shall the desired end be gained? The facilities for professional education in this country are so ample, that excuses for foregoing the advantages presented are utterly invalid, and the student who has served his term of private study, need not be thwarted in his purpose of honorably practicing his chosen and most worthy calling.

Empiricism and mountebankery rear their hideous forms from the undergrowth of ignorance all over this wide land, and would seem to prosper—to those who are struggling from day to day, honestly, earnestly, and intelligently to obtain a livelihood and achieve a worthy reputation. But the mountebank show is false, it is glossed over with the gold from the pockets of many a worthy and confiding patient, who will, most assuredly, pronounce the dictum upon that avariciousness and dishonesty which clutches at their hard-earned gains with pretentious assumptions. Then, to those who would eschew this class of operators and would rise above the level of mediocrity, I would say, read, study, write; and when opportunity presents, fall into the line of noble pioneers who are working, laboring, striving for your good.

The basal knowledge as offered by our collegiate institutions being attained, then work—work with a will to gain that goal planted by your Alma Mater. Be honest, be true.

But it was not my design to offer a dissertation upon the moral obligations of the dental practitioner, but to make reference to a few of the causes of failure which are daily brought to my observation.

The operation of filling a cavity, I deem, is not necessarily complete, until the visual causes which would promote further decay are removed; for instance, a spongy or fungus gum approximates a cavity of decay to that extent that it is necessary to wedge it back in order to gain access, and, though the operation of filling is skillfully performed, a degree of failure may be anticipated by allowing the gum to return over a portion of the filling, thereby forming a receptacle for the retention of depraved mucus and other foreign matter. This is but little better than a porous or spongy filling. The proper treatment of the gums is necessary to complete success.

Again, in reference to the treatment and filling of pulp cavities which have remained open for an indefinite period. To fill such teeth upon first presentation, is almost certainly to excite the periosteum to a degree of congestion or inflammation; and too great haste in the treatment thereof

will tend to similar results. In most cases of failure it will be proven that either sufficient time or care was not taken in the preparation of the cavity; that the dentinal exudates were turned back too suddenly upon the investing membrane, thereby causing irritation. My usual plan is to thoroughly cleanse the cavity by excavating and syringing with cold water at the first sitting. In about six hours, syringe again and saturate with creosote, leaving the cavity open. The next day syringe—always with cold water—and apply cotton and creosote, which, after three or four hours, may be removed, the cavity left open a few minutes, then another pellet of cotton slightly moistened with creosote may be packed carefully but firmly into the root and covered with gutta-percha. In one week, if all has gone right, a permanent crown-filling may be inserted over the gutta-percha. This plan, in my own practice, is generally attended with success.

Another common cause of failure, in the filling of approximal cavities, is a want of thoroughness in excavating that portion of the dentine nearest the neck of the tooth. This is particularly so when there is a spongy condition of the gums, which, as before observed, should be first restored to perfect health.

Many fillings too are failures from the imperfect condensation of the first portions of gold introduced. After anchoring the initial pellet, the utmost care should be taken that it does not become moved from its position. To prevent which, it is desirable to have an assistant who will press this portion of the gold to its place, while the operator proceeds to weld to the piece thus secured.

Finally, let each successive step in the operation be thorough, and you will have the satisfaction of knowing that the result is really excellent.

TAKING IMPRESSIONS.

BY JOHN C. K. CROOKS, M.D., BIRMINGHAM, MICHIGAN.

THE importance of exercising the utmost care in the operation of procuring an impression of either jaw, for the purpose of constructing dental substitutes, is, I believe, not appreciated by many members of the profession. An imperfect model, particularly in working the vulcanite base, is a sure source of failure in the end. There may be a tolerable adaptation in the yielding wax or in the gutta-percha, but when the case is completed—when we have an unyielding substance like the vulcanized rubber, then, to our great perplexity, all imperfections manifest themselves, and we see the importance of exercising care in the beginning. With a metallic plate, the matter is not of such great consequence, for, when the plate is “struck up” and ready for the teeth, we never think of taking a step in the advance until our plate is tried and found to be everything we desire.

Thus, a correct impression in vulcanite work being of such moment,

the question of practical importance is, *how shall it be obtained?* In answering this interrogatory, the first and all-important thing to be remembered is, *that plaster of Paris expands in setting*, and from the peculiar form of the impression cup, there must unavoidably be a change somewhere, unless certain precautions are adopted. The point at which this change takes place, in impressions of the upper jaw, is the convex surface of the impression—that part which is applied or corresponds to the hard palate. The occasion of this is, evidently, from the plaster being held firmly in a lateral direction by the sides of the cup, the expansion must be in a vertical direction or at right angles thereto, thus laying the foundation for that unpleasant condition of things, a rocking plate. In impressions of the lower jaw, the expansion of the plaster causes a tilting up of the impression at the ends of the cup, so that, when applied to the jaw after setting, there will be an undue pressure upon that portion of the alveolus corresponding to the last molar and the dens sapientiæ. This being the condition when the case is completed, the wings of the plate will bear forcibly at the points mentioned (not going down sufficiently), and also (which is of more consequence) along by the frænum labii inf., from one canine tooth to the other, the edge of the plate will cut into the soft parts, much to the discomfort of our patient, while the plate will not touch at all beneath the bicuspid and at the frænum linguæ. These results I have seen again and again in my earlier operations, and concerning which I have heard complaints without number from my professional brethren. But to the remedy!

All of the annoyances arising from an imperfect model can be surmounted by one or two expedients. In the first place, the impression cup *itself* must be made as nearly as possible *to fit the jaw*; which can be accomplished by laying on wax at one point and another where it may be demanded. This being effected (and for the following object solely is it done), but *little plaster of Paris must be used*, so that when the impression is removed from the mouth, the plaster will be found less than a line in thickness. Such an impression can be laid aside without fear of change, and used as convenience may require. Secondly, all obstacles can be overcome by working *rapidly*. By this I mean that we can take our impression as we please—using any amount of plaster of Paris; but as soon as it will be safe to do so, remove it from the mouth, trim, varnish, and oil it, and pour in the plaster for our cast, separating the same from the impression so soon as that can be accomplished without damage. In this manner we do not *wait* for a thorough *setting of the plaster* and a *consequent expansion*, either in the impression or in the cast taken therefrom. But to effect the desired end by this method of manipulating, it must be borne in mind that the impression must be taken, and the cast made, *all in a few minutes*. Hence, when substitutes are required for both jaws, the labor upon one should be completed, so far

as procuring the cast, previous to resorting to the other. This latter mode of procedure, from the expedition required—*nunc aut nunquam*—I have adopted, and if all subsequent work is performed well, I never have a misfit.

PROCEEDINGS OF DENTAL SOCIETIES.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOMAS C. STELLWAGEN, D.D.S., A.M.

A MEETING of the Society was held in the building of the Philadelphia Dental College, on Monday evening, January 8th, 1866, President, Dr. Jas. M. Harris, in the Chair.

The following subject for the evening was taken up:

“THE OPERATION OF FILING, METHOD OF PERFORMANCE, AND THE INSTRUMENTS EMPLOYED.”

Dr. Ellis said that the immensity of the subject would preclude his satisfactorily responding to the invitation to open its consideration, for its very vast and important details so press upon the mind as to confuse one in the effort to give them utterance. He would start the discussion, however, by a few brief statements in relation to the operation of filing teeth. It seems of first importance to pronounce upon the advisability of its performance, and subsequently to hear from its advocates their methods of procedure. He felt a strong prejudice against the employment of the file for the removal of superficial caries, believing that in the greater number of cases it would fail of its object; considered it entirely contraindicated in any other than the most dense and perfectly-developed teeth, and felt best satisfied even in these cases to make its use conditional and dependent upon a combination of circumstances precluding the employment of sufficient time to effect their proper preparation and filling. Notwithstanding this aversion to the use of the file, caused by witnessing the large proportion of failures, even when the instrument was manipulated with judgment and skill, he regarded it a valuable addition to the dental case, and useful in reducing thin and friable edges of teeth prior to filling, in dressing off the superfluous metal, removing surface inequalities, giving to the filling a proper contour and face susceptible of smooth and brilliant finish. Some operators prefer the file for removing large quantities of tooth structure to render cavities of decay visible and accessible; while others accord the preference to the chisel, believing it to accomplish the same result with greater expedition and less unpleasantness. With the latter he would agree, but its exceptional employment for this object, prompted by peculiar circumstances, constitute, in connection with the above, the only purposes for which he conceives it adapted.

Dr. Flagg said that “rotation” is an American policy, and he thought

he could here follow, taking up the subject where Dr. Ellis left it. He thought that in the vast majority of cases in which filing had seemed to prove beneficial, the teeth would not have decayed had it not been done; judged this from condition of cavities in the other teeth of the same mouths; thought that filing was injurious in 99 cases in every 100; prefers to wedge teeth apart and fill even small cavities, rather than cut or file away the enamel; makes "simple" cavities out of "superficial" ones, by excavating them deeper. He would not be understood as meaning to deprecate the use of the file in front teeth entirely, but as employing it very, very rarely. For molars and bicuspid he used a file curved so as to clear the corners of the mouth, differently bent from others in general use. (He here exhibited file.) His observations had led him to regard the use of the file as advantageous in some places and not so in others. He could not help contrasting the old fillings of thirty, forty, and fifty years' standing, which had been placed in molars and bicuspid with the *free use of the file*, with the more recent, elegant "contour work;" which, although sometimes looking well, yet, he thought, generally failed too soon. In his own practice he had, after trying the new method for six or eight years, gradually returned to the old-fashioned way. He supposed some would denounce this as "backsliding," but he felt *able* to backslide if this was doing so. In filling cavities between molars and bicuspid, he now usually filed freely, even to an angle of 45° ; finding this course more preservative, as well as productive of more comfort to patients during mastication; he endeavored to leave as little dentine exposed as possible, and found that the constant and *hard* friction usually produced a polished and non-sensitive surface.

Dr. J. E. Garretson expressed himself as a decided advocate for the use of the file; true, he said, it was not necessary in every case, and many presented in which its use could not but be positively injurious; but his experience led him to infer that in the vast majority of instances operations were not to be performed substantially without it. It was his experience that for the maintenance of integrity in a filling, the surface must be a self-cleansing one, to possess such a surface, the face of the plug must represent more or less closely an inclined plane; to such a principle he adhered in his operations as closely as possible. As example of the use and abuse of the file he offered the following illustrations: "If approximal cavities existed in two incisor teeth, the teeth being as generally found, that is, approximating as closely near their necks as at the cutting edge, his practice would be to cut these teeth with the base of a V, looking back into the lateral aspects of the mouth, but leaving an unseparated portion at the necks of the teeth to insure their remaining separated just as he had filed them; he would thus secure three advantages: plenty of room to work at the cavities; clean, pure faces to the teeth, which would show nothing of the plugs; and continuous self-cleansing surfaces."

Would suppose again that these teeth were narrow and non-impinging at their necks; then the file so extensively used would prove injurious; would wedge such teeth apart, and having filled them, would allow them to come together, or, what would be much better, would try every possible device to get the plugs still on an inclined plane that would maintain itself. Such a success is oftentimes to be accomplished by using the space secured by the wedge to file in, the file cutting with a convex face upon the back of the teeth, and leaving intact their labial faces. It must be evident that where such filing can be practiced—and it applies to most of these kinds of teeth—that while it secures the plane, it still leaves intact that anterior-lateral aspect of the teeth, which, on their coming together, takes the pressure. Said that there were, however, some teeth on which no kind of a self-maintaining inclined plane could be secured; in such cases wedging was the only practice, but such teeth were not apt to be preserved for any great length of time by the operations performed upon them.

Dr. Flagg had seen a great many cases in which these so-called, self-cleansing surfaces were very sensitive—particularly near the necks of the teeth. He thought this pertained particularly to the front teeth, perhaps in consequence of want of *sufficiently hard* attrition. To overcome this he expended time and trouble in wedging, and thus gained space to fill the cavities between front teeth without removing the surrounding enamel. To remove this sensitiveness, he applies deliquesced chloride of zinc, and recommends a constant use of antacid powders and washes.

Dr. J. E. Garretson.—The objection urged to such removal of enamel by Dr. Flagg, would at first thought seem to be a valid one; but he remarked that it was not his experience that such sensibility often troubles the patient; the exposed dentine is to be highly polished just as the plugs are, and, being like the plugs, self-cleansing, retains no lodgments, and consequently is subjected to no marked irritative agents.

Dr. McQuillen said that, as a general thing, with the aid of chisels and the curved three-cornered scalers, he could in a much more rapid and quite as efficient manner effect all that was claimed for the file in the separation of teeth, and thus obviate the necessity in very many cases of using an instrument that is very disagreeable to the majority of patients. There were circumstances, however, under which he would employ it, as in removing the rough and ragged edges around the thin margins of a cavity, or in finishing off the surface of a filling.

Dr. Breen did not approve of employing the file for separating the incisors if unaffected by decay, but he sometimes used it for the purpose of removing superficial caries, and of the ragged edges of cavities prior to filling. He had used the chisel with equal facility under such circumstances. In operating on the approximal surfaces of the bicuspsids, he used orange-wood wedges for separating.

Dr. Flagg said that he had been trying to *average* the duration of fillings in different parts of the mouth, and he thought that eight years would be about the length of time to allot to those in cavities between incisor and cuspid teeth. Had seen excellent work fail in one year, and very ordinary operations in good preservation after a lapse of thirty or forty years; but had endeavored to take all considerations into account, and offered "eight years" as the average. He thought that fillings with enamel round their edges would last as long as those surrounded with dentine, and he was of the opinion that, as a general rule, they were even more comfortable to patients.

Dr. J. E. Garretson.—A tooth, after being filled, should look quite as beautiful, if indeed it may not be improved on its former self; desired to ask Dr. Flagg if he was not compelled to admit that teeth plugged after the filing of an inclined plane were not in appearance much purer looking, translucent and artistic, than those in which the fillings corresponded to the natural contour of the teeth? It was his experience, he remarked, that while the one kind of plug was always bright and clean, the other was as constantly found dim and unpleasant looking. In finishing plugs, Dr. Garretson remarked that he always made use of a piece of common lampwick, wet and covered with pulverized pumice. No tape of corundum or other material had ever answered in his hands a better purpose; it acted the part of a very fine file, capable of being graduated according to the coarseness or fineness of the pumice or material employed. It was cleanly, and from the character of the wick, naturally took the shape of the part to be acted upon.

Dr. Harris had seen many teeth that were filled, with cleansing surfaces. Speaking of sensibility, he gave an instance of a lady with sensitive dentine under the fillings. The question is, what was the difficulty? Was it the pressure of the gold on the nerve-filaments of the dentine? He recommended the use of chalk or plaster on a tape for overcoming the sensitiveness of the dentine where denuded of the enamel, and spoke of gold as a conductor of heat and cold.

Dr. McQuillen, in cases which he thought did not warrant the use of the chisel or file, was decidedly in favor of immediate and forcible wedging with orange-wood with the aid of the mallet, so as to secure at once space sufficient to operate in. Having tried this plan for some time past, he much preferred it to the slower, more tedious, and annoying process of using pieces of India-rubber, muslin, etc., for a number of days. The former course he believed much less trying to the nervous system than the latter.

Dr. Harris alluded to the change of the constitution of the people, owing to the manner in which they live.

Dr. Stellwagen mentioned his own mouth as an instance where filing might have been deemed advisable, as teeth treated in this manner for superficial caries had remained sound, while others had given unmistak-

able evidence of their inability, without assistance, to resist decay, although apparently sound at the time of filing the first.

The meeting then adjourned to meet on Monday, February 5th, 1866, at 8 P.M., in the same place.

BROOKLYN DENTAL ASSOCIATION.

December 13th, 1865.

BY W. C. HORNE.

THE following paper on the subject for the evening was read :

THE PRESERVATION OF EXPOSED DENTAL PULPS.

BY DR. W. H. ALLEN.

The preservation of exposed pulps is a subject upon which much has been said and much written; but one upon which very few carefully studied and recorded facts have appeared. What has been said upon this subject has been generally hearsay evidence or guess work. True, some cases of radical cure are reported by reliable practitioners, where a new deposit of bone has been discovered completely covering and protecting a dental pulp which had previously been exposed and bleeding. I have in my own practice had one or two cases of this kind, where, by careful treatment and protection from the air and moisture and from thermal changes by a non-conducting filling, the pulp has in a few weeks been so thoroughly covered by secondary dentine that no discovery of it could be made with the finest pointed instrument, and where the surrounding dentine had preserved all its sensitiveness. This is not a very brilliant record,—two cases in twenty-five years' practice,—and must be considered rather as a rare exception than as the rule. In many other cases, where the indications were equally favorable and the treatment the same, I have found, after a few weeks, a nasty, stinking mass of decomposed pulp. Many dentists doubt the propriety of ever filling a tooth which has had its pulp exposed, without first destroying and removing this sensitive and annoying body; and if the record of all is as slim as my own, they would seem to have good reason for their opinion.

Inflammation and suppuration do not always occur immediately after the operation of filling over an exposed pulp, even if the pulp dies immediately. Indeed, the tooth may remain for years a valuable member of the dental arch, giving no cause for complaint, and presenting very little if any appearance of having a dead pulp; but generally, sooner or later, swelling, throbbing, and pains in the surrounding parts indicate that the attempt at restoration and cure has been an unsuccessful one.

Dr. Kœcker, who was the first to recommend that teeth be filled in this manner, expressed the belief that "five out of six teeth may be preserved alive and rendered useful for a long space of time" after the pulp has been exposed; but I think the indications in these cases are very apt

to be deceptive, and in many cases we cannot see the patient to make the proper examination necessary to the formation of an intelligent opinion on the subject. I wish we might have more extensive records of thorough and intelligent experiments for the preservation of dental pulps than we ever have had, and it is possible that the opinions of some whom we deem enthusiasts might be more nearly verified than we now suppose. Let me here say, by way of digression, that one of the great wants of our profession is *close, thorough, and extensive research and record*, not only upon this, but upon almost all branches of our interesting specialty.

This is a subject which I deem of great importance, and one which should not be dismissed lightly, for we all know how much better is a tooth which has a living pulp than one where that membrane has been removed. Although a tooth may remain in the mouth and perform its ordinary functions, "it may be for years, and it may be forever," without a live pulp, still, without the nutriment which is furnished by that delicate and life-giving mass of nerve, artery, and vein, the tooth loses much of its strength, is more liable to be attacked by caries, and more subject to irritation and inflammation from the thermal changes so frequent and severe in the oral cavity.

Reasoning from analogy, I see but one cause why the pulp of a tooth, after being injured, may not be cured as well as any other tissue of the body, and that is, the fact of its being surrounded so closely by a hard, unyielding substance, which will not suffer congestion of the pulp without compression and pain, and in many cases strangulation; but this one cause must be acknowledged to be a very serious one, and one which cannot be overcome except by phlebotomy.

Although acknowledging such lack of success in my efforts for the preservation of pulps after exposure, I would by no means advise their wholesale destruction, but rather, by endeavoring to point out what I deem the most effectual means of treatment for their preservation, try to stimulate others to more careful and thorough experiments. And let me advise not only careful and thorough experiments, but *as* careful and thorough *record* of the facts elicited by our experiments; for it is only in this way that we can get the full benefit of the research we make, and be enabled to carry with our statement the weight which well-attested facts always have.

Coming now to the consideration of the best method of treatment to insure success in this, at present, most uncertain of operations, let me first advise attention to the constitution and habit of body of the individual under treatment; for success or failure in many of our operations is undoubtedly due to the natural characteristics and present condition of the patient. There are some persons who are so susceptible to irritation and inflammation that, knowing this susceptibility, I would never think of success in the practice of an operation so delicate and uncertain as the one under consideration. But with other constitutions the case is quite

different; nothing seems to disturb them, and a living, throbbing dental pulp can be punctured, and the tooth be filled immediately, without causing any pain or uneasiness at the time or afterward. True, these cases are not frequently met with, but I have seen many such, and doubt not you can all bear witness to the same fact.

I would advise first, that we experiment only upon those pulps which have been recently and not very freely exposed to outside influences, and which have not been wounded or painful, carefully noting the success or failure, together with the various conditions of the tooth and its surroundings.

I have practiced several methods of treatment, differing somewhat from each other, but all having for their object the best possible protection to the pulp without pressure upon it. Formerly I used caps of lead, making them slightly concave that they might not press upon the pulp, and filled over them. Afterward I used strong gold caps, made concave also (the concavity filled with wax or Hill's stopping, these being non-conducting substances), and placed a solid plug over these, which was designed to be permanent. But the difficulty of learning anything from the great mass of such operations has been the want of record, and opportunity afterward to test them.

I would recommend now a method, which, though not new, seems more likely to be successful and instructive, and which is as follows: after making careful diagnosis of the case (and no diagnosis should be made without great care), and taking into consideration the constitution, state of health and habits of the patient, I would, after a thorough removal of all the defective portion of the tooth within and about the cavity, taking care not to wound the pulp, fit a concave metallic cap over the exposed pulp, and so place it that it will protect but not press upon it; then fill carefully with some non-conducting substance, like Hill's or Bevin's stopping, and direct the patient to come in a few months for an examination. Then, if the operation has been successful, a solid gold plug can be substituted for the soft one. In cases where the pulp has been wounded or has given pain from any cause,—if thought advisable to try and save the pulp alive,—I would, after removing the decay as before, saturate thoroughly with creosote until all pain has ceased, and then pursue the same course detailed above, being careful always that no pressure shall come upon the pulp.

I have thus, in a very cursory manner, indicated what I consider the most natural and reasonable method for the "preservation of exposed dental pulps." I will close in the words of our lamented brother, Dr. Harris, as follows:

"If I have not spoken as confidently of the practicability of saving exposed pulps in all cases as I could have wished, it is because I would not have the young practitioner attach a value to any of the methods of practice which I have noticed, that may not be fully realized by future

experience. Much yet remains to be learned. It is not sufficient that we have succeeded in a few cases for a given length of time, or that we have utterly failed in a certain number, without having made ourselves thoroughly acquainted with all the circumstances connected with each individual case, and all the subsequent phenomena to which the treatment shall have given rise. When this shall have been done, we shall be able to form correct conclusions upon the subject, and not before."

Dr. W. H. Atkinson then read as follows :

In this caption (the preservation of exposed pulps) the covert desire to preserve alive the endangered pulps of useful teeth is plainly seen.

Various as has been the success of efforts to that end, nevertheless a survey of a very limited number of cases will indicate the feasibility and simplicity of the means requisite to success in the proper hands. I do not say, by any means, that uniform success will crown the efforts of the fool-hardy novice in this more than other branches of surgical practice !

Careful study of the anatomy, physiology, and pathology of the teeth and general system, must precede the ability to effect this desirable purpose of the humane dental surgeon.

When I say anatomy, it is to be understood that *microscopical* anatomy and *histological* anatomy are part and parcel of that study that is to lay the foundation of our physiological and pathological views, upon which to base a practice that will not disappoint our hopes of saving alive the majority of pulps that are exposed. It has been the earnest desire of the best members of our body to preserve the *vitality* of the natural teeth by any and all means at their command.

Now, it is well known that many pulps are in effect "exposed" long before the decay has penetrated to the cavity in which they are hidden away from the rude contact of solids and fluids, capable of irritating them, in the form of food necessary to the sustenance of the body.

In very many instances of decay, apparently but superficial, the integrity of the lime-salts in the dentinal fibres or tubules is so far interfered with by the action of acids causing the decay, that it becomes necessary to remove or neutralize those in the remaining portions of the tubules covering the pulp, before filling the cavity, to enable us to preserve the pulp in good and healthy condition.

Many cases of loss of vitality of pulps have followed the practice of filling without this precaution, which have been attributed to "thermal shock," "galvanic shock," etc., all of which would have been prevented by a judicious application of pure creosote to every cavity so situated ; leaving it in long enough to expel every other fluid, thus securing the innocuous carbolate of albumen as a non-conducting protection to the inclosed pulp.

In cases where we have reason to suspect decalcification of the dentine has invaded the whole length of the tubules, it is much better

practice to so shape the cavity as to secure good, sound margins, leaving a portion of decalcified dentinal substance to lay upon and protect the pulp, than to be so earnest to remove every particle of changed structure as to risk exposing a delicate organ requiring rare skill to successfully manipulate.

The uniform habit of saturating every cavity with creosote before filling will do more to secure the preservation of exposed pulps than any other single mode of procedure that I am acquainted with. Where the pulps are already bare, and in plain sight, when we first get control of the case, it becomes our duty to determine whether there be derangement of nutrition of the pulp-tissues already present. Dr. W. W. Allport, of Chicago, has reduced this practice to a definite system of procedure. It is understood to consist in amputation of the exposed portion of the pulp with a sharp instrument fitted to the purpose; after which the edges of the pulp are peeled off from the margins of the chamber, with a delicate spud, far enough to allow the lips of the wound in the pulp to fall together by the resilience of the tissues, securing union by the first intention, and a recession of the pulp within the chamber sufficient to enable the operator to fill the cavity of decay without encroachment upon the pulp territory. This is regarded as the "ne plus ultra" treatment in such cases, and so soon as it is generally adopted it will no longer be looked upon as "a fanciful statement of an unwarrantedly bold practice in the hands of a few would-be leaders in the profession!"

There is little hazard in saying that when this has been faithfully put in practice, it will become as common as (and more satisfactory than) devitalization of exposed pulps now is, in teaching and in practice.

To sum up in a few words then. Treat all cavities whatsoever with creosote before filling, and amputate all projecting cornua of exposed pulps, and treat with care afterward by temporary fillings, until you are sure of an established healthy action in the healed part of the pulp; after which, fill permanently, and the great majority of exposed pulps will be preserved for indefinite periods!

If any object to this treatment as more difficult than devitalization and filling of canals, let them be assured that it is by no means so uncertain of execution and doubtful of utility as is the old method, even in the best hands.

Besides, in case of a failure to preserve the vitality of the pulp, we have the old resort yet within our reach! and it then may be invoked with as much confidence as in any case of spontaneous death of the pulp.

A settled determination to be as good as the best, and to perform the highest good for our patients at each opportunity to exercise our skill, coupled with openness of mind to listen to and reject, or approve and adopt, all that can further our progress so soon as it commends itself to our understanding, will go far to make us see eye to eye, and bring out by our conjoined efforts a code of principles and practice worthy the adoption of all and commendation of the highest!

The subject being now open to discussion—

Dr. Mills considered it important to carry experiments in treatment to as great an extent as the convenience of patients will admit, and urged increased watchfulness of this special class of most interesting and important cases. He had devoted much thought and study to the subject, and though he had not been repaid with the success he desired, he was impelled to persevere in the hope of being yet rewarded.

Dr. Paddock, in filling where a very thin dentinal layer protected the pulp, by a careless blow of the malleter, punctured it, which was followed by bleeding; after this had stopped and the cavity been dried, he proceeded with the operation, and the tooth, thus filled with gold, was alive and sound a year after.

Dr. Francis doubted the policy of experimenting with exposed pulps; he had never met with any success in so doing; and in the cases tried, the difficulty in learning the consequences was very great indeed.

Dr. Fitch found nothing in his practice more annoying than in excavating a fine tooth to discover that the pulp was exposed. The probability is that the tooth will die; but a uniformity of results cannot be expected in a diversity of constitutions; and it is a very difficult matter to judge of the strength of constitutions. If it were possible to cut off all thermal changes, he thought success would be sure. He had plugged numbers of teeth where the pulp was exposed, and there had been no subsequent pain; whether the pulps still lived he knew not. The filling should not come in contact with the pulp, or inflammation will be set up and death occur by congestion.

Dr. Clowes made it his practice, in former years, when teeth had ached severely, to take them out, owing to the bad effects he had found due to the presence of dead teeth. This was an error. Sometimes he exposed the nerve of a front tooth in excavating, and applied nothing more than a piece of court-plaster over it, and never had a complaint from such a case afterward. He only treated fresh cases in this way. When a tooth is aching, nothing is more certain than that it can be saved. Kill the pulp with pure arsenic, and plenty of creosote; three to five days is sufficient. In cleaning out a cavity, if the nerve was not exposed he took great pains not to expose it; especially where he had reason to suppose that a layer of decalcified dentine was its only protection. In such a case he made sure that the edges of the cavity were strong and free from decay, and all that could happen to the bottom layer would be, it would dry up. Before introducing the metallic filling, however, he should interpose a layer of cork or gutta-percha, having previously moistened the cavity with creosote. He used a very little pure arsenic, and carried it directly to the point of exposure; and thought it occasioned less pain than when morphia was also used.

Dr. John Allen thought an opinion of the results of treatment could not be formed that would always hold good, owing to the difference of

constitutions. He attributed the absence of pain in his application of arsenic and morphia to its being made directly to the exposed pulp in a very minute dose.

Dr. Kingsley asserted that exposed pulps had been kept alive for years, in contact with foreign bodies; and detailed some instances which had come under his personal observation.

Dr. G. F. Foote believed he had saved some exposed and some sick pulps. He eschews all escharotics, and saw no necessity for saturating cavities with creosote. The excision of the pulp is very proper, and its best covering is the blood that exudes; this forms a non-conductor, and lies in perfect harmony with the pulp. After the wounding or excision, he lets the blood dry away and covers that with a layer of spunk, over which he makes his filling. An escharotic makes a sore, and destroys the vitality of any soft tissue with which it comes in contact; the nerve to which creosote has been applied will surely die.

REPORT OF DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

At a meeting of the Society held December 6th, 1865, Dr. Atkinson read a paper upon the subject of the evening, "HYPERTROPHY OF THE CEMENT."

After the reading of the paper, he continued with some remarks.

Dr. Atkinson believed hypertrophy of cementum due to disuse of the tooth or root, and had not seen it under other circumstances. Would give fifty dollars in gold for a well-authenticated specimen proving it to arise from the opposite cause, viz., excessive use, as laid down in all the books regarded as authority among dentists.

He had some reason to believe that excessive use produced *atrophy* instead of *hypertrophy*. Instanced the teeth of old people that had been in vigorous use to the last, always presenting thinned, shortened, and narrowed dimensions, no less than a transparency not found in young teeth or those that are subjects of hypertrophy of the cement!

It did seem to him that the slightest appreciation of histological phenomena, and even crude apprehension of the act of nutrition of tissue, would forever preclude such blunders as have thus far characterized the textual writings upon this subject!

Tissue, under continued pressure, is not nourished, but dissolved and removed, whether that tissue be normal or abnormal. Instanced obliteration and cure of "bursæ mucosæ," aneurisms, and varicose veins by means of pressure alone, or in combination with change of temperature, etc. etc.

On the other hand, alternations of pressure and relaxation are the best means of securing vigorous nutrition in all the tissues of the body.

Said rest (quiet) was necessary to crystallization (consolidation) of osseous and saline substances alike; therefore, continued agitation prevents both; hence the wasting of the bones in immediate contact with the ever-pulsating arteries in contact therewith, so beautifully displayed on the inner surface of the human skull.

In the case of cemental union of two or more teeth, the peridental membrane is absorbed at the points of contact, and then the calcareous salts are inspissated and crystallized into these cemental bonds of union between the roots of teeth deprived of the stimulus of occlusion!

Had seen the so-called "*bony epulis*" produced by scarifying gums for scorbutic affections, as recommended by some authorities. The explanation of which is a triumphant vindication of the doctrine here advocated, viz., that stasis of the nutrient plasm is necessary to the production of bone.

Did not believe that lime absorbed from one structure was employed to build up adjoining ones.

Biting threads with incisors might dislocate them, but would not produce hypertrophy. The root might become hypertrophied subsequently for want of occlusion.

If a tooth is to some extent displaced from its alveolus and not sore to the touch, it may be taken in general as an indication of hypertrophy of cementum.

In such case all that is necessary is to incise the gum, alveolar process, and peridental membrane freely, thus setting free the contained plasm. After which the cure will be completed by the proper adjustment of antagonism to the diseased teeth.

The philosophy of this mode of treatment has already been indicated, and will commend itself to those who will take the pains to prove it in practice.

In every case of hypertrophy of cement, nature "files" her "caveat" against infraction of the dental fraternity, which can only properly perform their function when well supported by mutual nearness and vigorous opposition by the serried host in the opposing jaw.

And as medicine, surgery, and dentistry are but handmaids of *Nature*, it will be well for us all to make close scrutiny of how she effects her evolutions in living bodies in states of health and disease, and follow closely upon her methods and means in our efforts to assist her benevolent intentions toward the conservation of the constituents of teeth as well as of the whole body.

Dr. A. C. Castle said, I have attentively listened to the reading of Dr. Atkinson's paper and his remarks thereon. My own experience and observations of thirty years are not in accord with the paper; they materially differ. I have never seen teeth isolated and without their opposing antagonists on the opposite jaws thus peculiarly affected with hypertrophy. On the contrary, I have seen such teeth, for the want of their antag-

onists, forced from their sockets consequent upon the thickening of the alveolar-dento-periosteum, until they have been elongated into the mouth and rendered a perfect nuisance to the owner, and especially to the dental practitioner when called upon to remedy the dental defects of the mouth. Ultimately these teeth loosen and fall out. Dental hypertrophy I have observed mostly where the teeth have their natural antagonisms, especially in that class of teeth whose pathological index marks the firm, solidly-constituted frame and bold muscular physique—the very opposite of those mentioned by Dr. Atkinson—physically presenting the yellow, dense bony structure found only in those constitutions of almost physiological perfection. It is true that hypertrophy occurs occasionally in other pathological conditions of the teeth. But here, in these hard, solid, and dense dental organs, hypertrophy most frequently occurs. I confess my ignorance of nature's occult mystery of nutritive organization; while for want of better ones I accept the many theories. I do not consider that two or more teeth ankylosed, while in the process of their formation, can be viewed as being hypertrophied, any more than the Siamese twins, a chicken hatched with four legs, or a child born with two heads, or with a superabundance of hands, feet, fingers, or toes, can be admitted as being born in a hypertrophied condition.

I will tell the gentlemen what they have seen, and what you may see in your office-practice almost every day. You will observe in the particular class of teeth to which I have already referred, that these are the only teeth which wear down or are abraded to the gums. In the process of this abrasion or wearing down of the crowns of the bodies of the teeth, slight indentations are often observed exceedingly tender under the touch, and often very distressing to the owner. As the teeth are worn down, the pulp gradually recedes—often, however, not as fast as the substance of the teeth is worn down upon them; hence the tenderness. We here observe that the dental vessels pour out a new deposit—*dentine*—an entirely different substance from the bone or ivory of the teeth. It is a transparent, amber-like deposit, and often fills the entire dental canal. Now, where the crowns of the teeth wear away too rapidly to permit the nerves to deposit this dentine to protect themselves, the secretions are deposited elsewhere, viz., at the apices of the roots of the teeth, and there we find the hypertrophy, or new deposit of dentine. So in cases of teeth filled with gold, amalgam, and other metals, including the galvanic action of clasps holding artificial teeth, we may observe these causes superexciting the nerves into an abnormal action; and in all these enumerated cases, one of the two actions occur: either the irritated nerves superinduce a secretion of dentine to recuperate or hypertrophy the dental organs; or they excite the absorbents to suck away their substance into a state of atrophy, when from these causes they loosen and ultimately are lost.

Dr. C. E. Latimer spoke of a central incisor whose cutting edge oc-

cluded with the cutting edge of an inferior incisor, and which was made sore, moved anteriorly and downwardly, as he believed, by cemental increase caused by the irritation of biting threads. He did not corroborate his theory by removing the tooth, but from another incisor quite similarly conditioned, which he did remove, he was led to believe the difficulty due to hypertrophy caused by misuse of the tooth.

Dr. J. S. Latimer had seen cases in which the anterior teeth were so much abraded as not to occlude by more than the eighth of an inch. Such teeth might exostose, and, when removed from the mouth, be deemed refutations of Dr. Atkinson's theory. He had formerly held different notions, but since the enunciation of Dr. A.'s idea a year ago, his observation and reflection had led him to believe that disuse is the cause of hypertrophy of the cementum.

Dr. Clowes indorsed Dr. Atkinson's theory. He thought the case of "dislocation" of a central spoken of by Dr. C. E. Latimer might be explained without supposing it to be hypertrophied. A superior incisor might be forced downward by inflammation and thickening of its peridentium, when by the lower tooth it would be forced outwardly, and thus the commencement of the difficulty be brought about.

Dr. Fitch remarked that truth is the object of all research irrespective of long-cherished opinions.

The causes of the disorder under discussion this evening are referable to two classes: those of a general and those of a local nature.

The domination of these two classes of causes preponderates in favor of the former, inasmuch as the mediate cause of all pathological action is perversion of function; while the procuring or exciting cause is generally local. Perhaps, in no single instance, is either of them entirely wanting; but the general cause must ever hold precedence, for, without its implication, no local cause can ever take effect. Could not say that every tooth assailed with hypertrophy of the cementum had an antagonist; but, were this the case, great pain must result from occlusion. Thought incision the proper treatment, but in most instances it would be thought too heroic—patients would not submit to be cut. Would recommend the obtunding of the gum over the affected root with *tr. aconite rad.*, applied on a small pellet of cotton-wool for a few minutes before operating. Then cut through gum, process, and peridentium.

LEBANON VALLEY DENTAL ASSOCIATION.

BY SIMEON H. GUILFORD, D.D.S., LEBANON, PA.

A MEETING of the dentists of Dauphin, Lebanon, and Berks Counties, Pennsylvania, was held in Reading on the evening of January 1st, 1866, for the purpose of organizing a dental association to be composed of the *professional* dentists of the above named and adjoining counties.

Drs. W. K. Brenizer, E. Moser, and J. Arnold, of Reading; W. H. Scholl, of Bernville, Berks County; J. W. Moffitt, of Harrisburg; and S. H. Guilford, of Lebanon, were present.

On motion, Dr. Brenizer was called to the chair, and Dr. Guilford chosen temporary Secretary.

On motion, a committee of three, consisting of Drs. Brown (of Reading), Moffitt, and Guilford, were appointed to draft a constitution and report at the next meeting.

On motion, adjourned to meet in Lebanon on Friday evening, March 16th, 1866.

The name of "Lebanon Valley Dental Association" was, by common consent, chosen as the name of this association.

We send the above condensed report of the proceedings of our first meeting to show that a move in the right direction has been taken by the dentists of this locality. The reports of our subsequent meetings will, we trust, prove more interesting to the majority of readers of the DENTAL COSMOS.

ST. LOUIS ODONTOLOGICAL SOCIETY.

BY G. GRANVILLE SAMUEL, M.D., ST. LOUIS, MO.

On the 26th day of October, 1865, a number of the resident dentists of the City of St. Louis assembled and formed themselves into a society to be styled the "St. Louis Odontological Society." A constitution and by-laws being adopted, the following officers were elected for the ensuing year:

President.—E. Hale, Jr.

Vice-President.—J. Payne.

Corresponding Secretary.—G. G. Samuel.

Recording Secretary.—G. W. Silvers.

Executive Committee.—A. D. Sloan, C. W. Gill, J. Payne.

Regarding a thorough and practical knowledge of anatomy and physiology as indispensable to the dental practitioner, and forming the true basis of all sound practice, the Society invited Dr. John L. McDowell to deliver a course of lectures before them on those important branches of study; who immediately entered upon the work assigned him, and in a very able and satisfactory manner discharged his duties as an instructor.

CENTRAL STATES ASSOCIATION OF DENTAL SURGEONS.

THE first semi-annual meeting of the Central States Association of Dental Surgeons will be held in the City of Nashville, Tennessee, commencing on Tuesday, April 10th, 1866, at ten o'clock A.M.

W. H. SHADOAN, *Secretary.*

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"On Tumor of Testis, containing 'Fœtal Remains,' with a Case. By W. H. VAN BUREN, M.D., Prof. of Anatomy, University of New York, etc. etc.—A male child, two years and five months old, was brought to me in the month of October, 1864, with a tumor of the scrotum, apparently involving the left testicle, about the size of a large hen's egg. The child was healthy at birth, and the swelling of the testis was not noticed until he was three months old, when a physician was consulted, who, regarding the disease as a hydrocele, passed a seton through the tumor, in the form of a worsted thread. So much pain followed this operation that the seton was withdrawn in three hours, a glairy fluid escaping with some force, but in small quantity, and the tumor remaining hard, and subsequently growing harder under the very severe inflammation which followed. After the subsidence of the inflammation the tumor remained at about its original size, but somewhat harder, for nearly a year, when several abscesses formed and discharged themselves consecutively; and finally, after quite a large abscess had opened, a red, fungous mass protruded from its orifice, which gradually reached the size of an English walnut.

"I found the tumor presenting fully one-half of its mass in the shape of this fungous protrusion, which was covered with unhealthy granulations discharging watery pus, hard to the touch, and occupying its lower and larger portions. Its upper portion, toward the spermatic cord, was generally smooth upon its surface, of a soft solid consistence, the skin adherent, and not very painful when grasped. It had never been painful except when the abscesses were forming, and when it was punctured. There were no enlarged glands in the groins. The child was weakly and pallid, and suffering from diarrhœa.

"Dr. Valentine Mott had seen the case, suspected that the disease was malignant in its nature, and advised its removal.

"I suggested to the father that he should take the child to the seaside for a month, and pay close attention to his diet. At the end of this time his health was very much improved, but the tumor was unchanged. I was able to form no positive opinion as to its nature, but felt no doubt as to the propriety of its removal, and I therefore removed it, by castration, in the usual manner.

"The child made a rapid recovery after the operation, and I have heard, within a few days, that he is in excellent health and growing finely.

"On examination of the tumor, after removal, the portion already described as a fungous protrusion, and which occupied the lower part of the tumor, was found partially covered at its lowermost surface by integument, and upon this integument, posteriorly, was a surface half an inch in diameter thickly covered with hairs, some of them an inch in length, and presenting, under the microscope, the characteristic appearance of hairs from the head. Upon the surface of the protrusion was the orifice of a fistula, and on introducing a probe into the fistulous tract it came in contact with a very hard, smooth, apparently bony surface. When

laid open by the scalpel, a cavity was disclosed about an inch in diameter, containing pus, and in contact with, and adherent to its walls, a fragment of bone, covered by periosteum resembling in shape a fragment of the body of a foetal lower jaw-bone. The length of this fragment of bone was five-eighths of an inch, its breadth three-eighths of an inch, and its thickness about the same. Implanted somewhat irregularly upon one of its margins were found four teeth, slightly altered from their normal shape, but distinctly recognizable as two incisors, one canine, and one molar, in their normal relation, and appropriate in size to that of the fragment (of jaw-bone) in which they were implanted. On withdrawing the molar tooth from its alveolar socket, which was normal in its proportions, it was found to present the crown of a well-formed molar, hollow within, and destitute of fangs. At the bottom of the alveolar socket the dental sac was distinctly visible, and protruding from its floor was the well-formed surface of a second (permanent) molar tooth, which, when touched by a probe, was soft and evidently not yet incrustated by enamel. It was with one of these teeth that the probe came in contact when introduced into the fistulous tract. Both the tooth and bone structure were examined microscopically, the former showing enamel prisms, and the latter the lacunæ and canaliculi of true bone.

"Situated above the cavity, which inclosed the bone and teeth, was a second cavity containing turbid fluid, and lined by a smooth, apparently serous membrane—the probable remains of the tunica vaginalis. In contact externally with the walls of this cyst was the testicle, normal in size and appearance, with the exception of an abscess, the size of a large pea, situated in its substance. The glandular elements of the testicle were recognized under the microscope. The mass of the tumor situated above and around the testicle, and constituting about one-half the tumor's bulk, was found under the microscope to consist of the elements of connective tissue, consolidated by inflammation.

"The microscopic examination of the specimen was made by Dr. J. W. J. Gouley.

"It is evident that the tumor is an example of that rare pathological condition known heretofore by the English as 'foetal remains in the testicle,' and by the French as '*inclusion scrotale et testiculaire*.' The latter designation is the more intelligible of the two, as it indicates the nature of this curious growth, which is an imperfect effort at the production of a double monster, or 'monstrosity by inclusion,' or *foetus in foetu* of the older writers. It is described as one of the varieties under this latter head in Vrolik's classification of foetal deformities, and he remarks that 'it is most probable that the *foetus in foetu* is an incomplete effort to form a double monster.' (Cyclopædia of Anatomy and Physiology, art. Teratology.) The term 'monstrosity by inclusion' belongs to the great French teratologist, Geoffroy St. Hilaire, and has been adopted by Cruveilhier in his '*Pathologie Générale*,' and applied to tumors containing foetal remains which have occurred in different parts of the body, *e.g.* in the perineum, over the sacrum, in the thoracic and abdominal cavities, the liver and ovaries, as well as in the scrotum.

"This explanation of the pathological nature of these tumors has been more recently disputed by Lebert, who endeavors to include them in his class of 'dermoid cysts,' or misplaced growths of normal tissues. The pathological law under which all these growths are developed is thus stated by Lebert (*Traité d'Anat. Path.*, t. i. p. 260). 'That both sim-

ple and compound tissues, and even more complicated organs, are capable of developing themselves in parts of the body where normally they do not exist.' This he considers that he has established, and its truth is generally admitted by pathologists. But Lebert does not entirely exclude the theory of inclusion, as will be inferred from the following quotation: 'I have brought together three cases of dermoid cysts of the scrotum, and endeavored to establish the points of difference which distinguish them from true cases of foetal inclusion occurring in this same locality—in which undoubted debris of the skeleton are recognizable.' (V. ut supra, p. 257.)

"The theory of inclusion of St. Hilaire has also been disputed by the latest authority on the subject. Dr. George Murray Humphry, lecturer on surgery and anatomy in the Cambridge University Medical School, the author of the article on 'Diseases of the Male Organs,' in Holmes' System of Surgery, who considers that Lebert's theory of 'heterotopie plastique' is entirely sufficient to explain the nature of tumors connected with the testicle containing foetal remains. (Holmes' Surgery, v. iv. p. 600.)

"The question as to the real origin of these tumors appears, therefore, to be still an open one, and it may be stated succinctly as follows: Is a scrotal tumor, containing so-called 'foetal debris,' the result of a local plastic effort determined by injury or inflammation, and liable to occur at any period of life; or is it the production of a fecundated Græfian vesicle accidentally included in the scrotum of a twin foetus, and thus arrested in its development, and of necessity congenital? This question is more curious than practically useful, for, as Dr. Humphry concludes, the only remedy for these tumors is to remove them by operation. Those desirous of pursuing it further will find it elaborately discussed by Lebert (as above), by Cruveilhier in his *Pathologie Générale*, t. i. p. 370, and t. iii. p. 582 *et seq.*, and by Verneuil in the paper referred to below.

"It follows, if Cruveilhier is right, that tumors connected with the testicle of this character must be always congenital, and such appears to be the fact. M. Verneuil has collected all the authentic cases on record, to the number of ten in all, and treated the subject very ably and exhaustively in a series of papers published in the *Archives Générales de Médecine* in 1855. The earliest recorded of these cases is the only one of the ten in which the congenital character of the tumor is not clearly demonstrated. 'A young man of quality, after exposure to sexual excitement, was seized with a sudden pain in the right testicle; this soon subsided, but shortly afterward he discovered an unnatural growth connected with the testis, which rapidly increased to the size of the head of an infant of six months, and within the year was removed by a surgeon of Sisteron, in France, named St. Donat. On opening the tumor, after its removal, it was found to contain the somewhat altered remains of a foetal cranium; the testis was compressed and altered in appearance, and the foetal remains seem to have been inclosed in a cyst attached externally to the testis.' The case was transmitted by St. Donat to Pierre Amand, a member of the Faculty of Paris, and published by Amand in a volume on Obstetrics, at Paris, in 1715.

"In a case reported by Prochask, 'an otherwise well-formed male infant was born with a small tumor in the groin, which was taken for a hernia. When three years old it commenced to grow, rapidly filled the scrotum, and in a few weeks reached as low as the middle of the thigh, when an abscess formed and discharged a fetid fluid, together with

several portions of the skeleton of a foetus, after which the child rapidly got well.'

"The following case, reported by Ollivier (D'Angers), presents some features similar to mine: Ovide-Emile Caze, well formed at birth, was discovered by his parents, when a year old, to have the right testicle larger than the left, and six months later was operated upon by Dr. Capon, for hydrocele. A little serous fluid followed the puncture, but the testicle remained larger than before, so that two years afterward another operation was talked of, but as the swelling was painless nothing was done. During his seventh year, the testis, having reached three times its natural size, became painful, and an ulceration having taken place, a reddish mass protruded, in which Dr. André having discovered a hard, white, polished surface resembling a tooth, diagnosticated a tumor connected with the testis, containing foetal remains. The protrusion increasing it was tied off, and afterward examined by Ollivier, and found to contain four teeth and a piece of spongy bone, contained, apparently, in a sort of cyst. The child, who was left mainly to nature, was thought likely to get entirely well. (*Mémoires sur la Monstruosité par Inclusion; Archives Générales de Médecine*, t. xv. p. 540.)

"In Velpeau's celebrated case, which occurred in La Charité Hospital, in Paris, while I was an externe in that institution, in 1840, the patient, who was twenty-seven years of age, had a tumor the size of the fist on the right side of the scrotum, which had existed since his birth. It was painless, and presented several fistulous openings, from one of which a tuft of hair projected, and this circumstance suggested the true nature of the tumor. Velpeau made it a point of saving the testicle, which could be distinguished from the tumor, although closely connected with it, and this necessitated a long and difficult dissection. The tumor contained much foetal debris and a number of easily recognizable bones of the foetal skeleton. The patient died of purulent infection. The case is recorded in the *Gazette Medicale de Paris*, Feb. 15th, 1840.

"In M. Verneuil's case, which occurred in the wards of M. Guersant, in the Children's Hospital at Paris, the foetal debris were very carefully examined by the microscope, and, among other tissues, the histological elements of the gray substance of the brain were distinctly recognized.

"Of the ten cases collected by M. Verneuil but two were diagnosticated; those of André and Velpeau. If the congenital character of these tumors is admitted, it constitutes their most valuable diagnostic feature. The diagnosis would lie between hernia, hydrocele, encephaloid cancer, and tubercular disease of the testis. It would seem easy to exclude the two former, although two of the cases noted in this paper were mistaken for hydroceles. Robert speaks of a case of congenital soft cancer of the testis; and I once saw a well-marked case of syphilitic enlargement of the gland, in a child of eighteen months, who also had periosteal swellings and other evidences of inherited disease.

"It is not unlikely that there are other cases of this curious affection which have not yet been placed on record, and if this imperfect notice of the subject should lead to any further additions to our knowledge by eliciting unrecorded cases, or by rendering their nature more apparent, it will have attained its object."—(*New York Medical Journal*.)

Interdental Splint.—In the February number of the *Richmond Med. Jour.*, Dr. E. N. COVEY gives a sketch and description of a new inter-

dental splint invented by J. B. Bean, D.D.S., of Atlanta, Ga., which has proved very efficient in preserving the coaptation of fractured maxillæ, over forty cases having been "treated with the most perfect success." The following extracts will illustrate its character and value: "The history of this class of fractures has heretofore brought as little honor to the profession as it has benefit to the patient; and so far I think we have looked, in vain, for the proper means of treatment.

"The appliances used by our most distinguished surgeons have usually consisted of ligatures, splints, bandages and slings. The use of ligatures of gold and silver wire, from the days of Hippocrates (who first recommended them) to the present time, has been very unsatisfactory, even in civil practice, and almost entirely useless in military surgery. In almost all instances, so much injury is done to the teeth that the application of wire is rendered impossible.

"The various splints, from that first recommended by Paré, to the clamp invented by Mütter, have all been used, with varied and unsatisfactory results, being in time discontinued, as failing to effect the desired object.

"The different clasps, used by Chopart and Desault, as well as those more lately employed by Bush, Lonsdale, Malgaigne, and others, have fallen into disuse. Recently the best surgeons, in this country, have adopted the bandage or sling.

"Hamilton, in his work on fractures, recommends, in connection with the bandage, an interdental splint of gutta-percha; but its application, in most instances, is so difficult or defective, that but little good has resulted from its use. His method was simply to reduce the fracture, apply the softened gutta-percha to the rami, and allow it to harden. This, in simple fractures of the rami, will, in some cases, do very well; but, owing to the great difficulty in keeping the parts in apposition, in compound fractures, and in those fractures near the condyles, it has failed to be of any decided benefit. These fractures have almost invariably united with more or less deformity; consequently the antagonism of the teeth has been destroyed and mastication has been very much impaired.

"Dr. Corné, a French surgeon, in 1855 invented an apparatus, which consisted of a gutta-percha splint adjusted to a band, this being fitted under the rami of the jaw with adjusting screws: he had with this apparatus some success.

"Dr. N. R. Smith, of Baltimore, used, in the beginning of the late war, a silver-plated splint, with impressions for the teeth; this was made to grasp the whole length of the fractured rami, and was adjusted with a counter splint and screws under the jaw, to which it was attached by means of a strong wire. One of these instruments I saw applied to a paroled officer, who, although he had been very carefully treated, recovered with very imperfect antagonism of his teeth and with deficient faculty of mastication.

"The idea of an interdental splint is not a new one, for they have been used for a long time. Splints of wood, cork, and other material have been tried, but their application did not fulfill all the required indications, in the treatment of this class of fractures.

"The desideratum, in treating fractured jaws, is to retain the fractured extremities in close and perfect apposition, thus maintaining the exact antagonism of the teeth, until provisional callus is thrown out and union is effected.

"The splint, constructed by Dr. Bean, fully meets these indications; and after a happy experience of over six months in its application, and with over forty cases (some of them, at first sight, apparently beyond remedy), I reasonably regard it as a very valuable improvement in surgery. The advantages of it need only to be made known, to render them fully appreciated.

"The instrument consists of an interdental splint made of vulcanized India-rubber, having on both horizontal surfaces cup-shaped depressions, sufficiently deep to embrace the crowns of the teeth. In the adjustment of the instrument, the teeth are placed in their corresponding indentations in the splint, and kept in position, by the mental compress and occipito-frontal bandage, to be described. This compress and bandage have advantages over all others I have seen used.

"The mechanism and construction of the instrument will be understood, by the following description :

"A wax impression is taken of the crowns of the teeth of the uninjured jaw, and of each fragment, separately, of the broken jaw, as soon after the injury as the condition of the parts will permit. When, in doing this, the ordinary 'impression cup,' used by the dentists, cannot be introduced, one composed of a thin metallic plate, which is covered with wax and stiffened by a rim of wire, may be substituted.

"From these impressions, are produced casts of plaster of Paris, very carefully prepared, so as to produce a smooth, hard surface, and giving as perfect representations of the teeth as possible. These plaster models are then adjusted, properly antagonized in their normal position, and placed in the 'maxillary articulator.'

"This consists of an upper and lower plate with the leaden wires connecting them by an adjustable hinge joint, and of plaster models in place, properly antagonized.

"The fragments of the model representing the broken jaw are held in their proper position and antagonism, with wax, being secured thus one to the other, and to the remaining plate of the articulator. The wax between the teeth is now pared away, that the jaws may be separated. We have thus prepared an exact model of the teeth, with a complete mechanism of the patient's jaws.

"The model jaws are now opened from three to five lines, and a wax model of a splint is built up interiorly and exteriorly between the molars on each side, with a connecting strip passing behind the upper surfaces of the superior incisors; leaving an opening, extending horizontally between the cuspids. This wax model, properly fashioned and rendered smooth, with the plaster models, is now removed from the articulator, and imbedded in plaster, in the ordinary 'flask' (used in the dental laboratory) for vulcanizing plates for teeth. The flask is then separated, the wax removed, and the mould packed with gum, in the usual way. It is then closed, and the gum, by heat, thoroughly vulcanized. The flask is then opened, and the splint removed, cleaned, filed to proper shape, polished, and its indentations made to conform to the patient's teeth.

"The adjustment of the splint to the fracture is very simple. It is inserted into the mouth of the patient; the fragments drawn forward, and the teeth adjusted to their corresponding indentations. The jaws are then closed and held firmly in position by the application of the mental compress and occipito-frontal bandage; this prevents any displacement of the splint or motion of the jaws.

"The mental compress is designed for retaining the teeth, in their indentations of the splint, by upward pressure applied to the base of the mental process, counteracting thus the traction of those muscles, which most tend to cause displacement. There is an advantage also in relieving the parts from the lateral pressure produced by the four-tailed bandage or double-cross roller bandage, generally applied to these cases.

"The compress is composed of a light piece of wood which is four and a half inches in length, three-sixteenths of an inch in thickness, and one inch and a half in width, in the middle, tapering to seven-eighths of an inch, and round at the ends; to each of which is attached a metallic side-piece four or five inches in length, and from three-quarters to one inch in width; also a shallow cup fitting the apex of the chin. Incasing these side pieces are the temporal straps made of stout cloth, and secured by a strong cord at the base of each piece.

"The occipito-frontal bandage is composed of a band passing around the head, from the forehead to the occipital protuberance behind, and secured by a buckle one inch to the right of the median line behind; of another strip secured to the band in front and behind; and a third strip extending from the temporal buckles on either side, and secured to the middle strip at the point of crossing.

"The advantages of this splint are its neatness; the facility with which it allows the patients to take nourishment; the almost entire certainty of its not being displaced, and the preservation of perfect antagonism of the teeth, with the absence, consequently, of deformity after the reunion of the bones.

"To enable the reader more fully to appreciate the advantages of the instrument, I have transcribed the notes of a number of cases kept at the time, by Dr. Bean, which show very conclusively the success of the treatment. Many of these cases I inspected myself at Atlanta and Macon, Georgia, and can add my own testimony as to their happy results.

"CASE 12.—Private N. P. L., vul. sclop.; fracture of superior maxilla. Wounded July 20th, 1864. Ball entered right cheek, one inch below the edge of the orbit, ranging across and backward, seriously fracturing superior maxillary and palate bones; going through the ethmoid and coming out a half inch below and somewhat in front of the meatus auditorius externus.

"Superior maxilla containing incisors, cuspids, and bicuspids (ten teeth in all), detached from its bony union in one piece. Patient much inclined to sleep; seems to suffer very little pain. Nares entirely obstructed with clotted blood.

"July 24th.—Removed fragments of bone; syringed the wound thoroughly.

"August 8th.—Wound somewhat phagædenic; symptoms disappeared in a few days, by vigorous remedial treatment.

"August 10th.—No union; fragment still quite loose; extensive supuration.

"August 18th.—Suppuration subsiding; applied vulcanite interdental splint and mental compress, with occipito-frontal bandage, forcing the fragment into its place.

"September 4th.—Teeth in perfect position; fragment quite firm; external wounds healing, and patient much improved in general health.

"September 12th.—Still improving; eats heartily of soft food. Furloughed for sixty days.'

“CASE 16.—Private W. W., vul. sclop.; fracture of superior and inferior maxilla. Wounded July 21st, 1864. Ball entered about centre of left cheek, ranging backward and downward, taking all of the upper molars and a bicuspid of that side; passing through the root of the tongue and under the second and third molars, came out near the right angle of the jaw, fracturing the body of the bone at that point.

“August 11th.—External wounds healed; teeth antagonize; no displacement.

“August 20th.—Considerable displacement of inferior maxilla.

“August 28th.—No indication of union as yet; displacement increasing; original antagonism of the teeth entirely destroyed.

“August 29th.—Applied interdental splint, mental compress and occipito-frontal bandage.

“November 8th.—Bone perfectly united, and the antagonism of the teeth as perfect as before the injury; has not been wearing the splint for some week or two past; speech somewhat impaired by adhesion, and disability of the tongue; explored the tongue, and found fragments of a tooth in right side entirely inclosed.

“November 10th.—Made longitudinal incision in right dorsum of the tongue, and extracted half of a molar tooth.

“November 20th.—Tongue much improved; still some adhesion.’

“CASE 49.—Sergeant J. L. B., vul. sclop.; compound comminuted fracture of superior and inferior maxilla. Wounded September 3d, 1864. Minié-ball entered the right cheek near the centre, and one inch in a horizontal line in front of the lobe of the ear, striking about the second upper molar. The three upper and one or two lower molars of that side being carried away, and the bone fractured between the lower molars and bicuspids, ranging downward and across the hard palate, producing considerable fracture of that bone, with laceration of the mucous membrane, and striking the molars of the other side near the line of their antagonism. All of the molars, upper and lower, of that side were carried away, together with portions of both maxillary bones.

“The lower maxilla completely severed beyond the bicuspids, and large fragments detached and lying in the wound when patient entered hospital.

“September 6th.—Patient compelled to take nourishment through a flexible tube and funnel; tongue much swollen; anterior fragment much displaced.

“September 10th.—Removed some spiculæ of bone.

“September 20th.—Removed other fragments of bone; no sign of union.

“September 24th.—Applied interdental splint, mental compress, and occipito-frontal bandage.

“October 3d.—Fragments in position, and union taking place.

“December 8th.—Bone united; antagonism of the teeth perfect; no deformity; jaw not yet strong enough for mastication.’

“CASE 50.—Major-General J. P. A., vul. sclop.; compound fracture of inferior maxilla. Wounded August 31st, 1864, at Jonesborough, Georgia. Minié-ball entered left cheek one-half inch from angle of jaw, one inch from base of bone, ranging forward and to the right, producing comminuted fracture of middle portion of body, and carrying away second and third lower molars of left side. Fracture then extended along the mental process, about the apices of the fangs of the lower incisors and

cuspid, horizontally, as far as the third bicuspid of right side; thence upward, between the bicuspid, separating, in one piece, the bone and alveoli containing the two bicuspid of the left side, and all of the incisors and cuspid and first bicuspid of right side. The ball, after leaving the body of the bone, near the apex of the fang of the second left bicuspid, passed upward through the side of the tongue; wounding the left ranal artery, and cutting the centre of the dorsum of the tongue (the mouth of the patient being open at the time), it passed out at the right angle of the mouth; fracturing and carrying away the crown of the superior right lateral incisor. Fragments of bone, etc. were removed on the field, and when the patient reached private quarters in Macon, Georgia, on September 3d, the wound was in good condition, hæmorrhage having subsided.

“The patient was perfectly quiet; and being unable to articulate, he communicated his wishes by writing. The fragment of bone, containing the front teeth, was very much displaced, being projected forward until there was a quarter of an inch of space between the bicuspid of the right side and the lower incisors: these last closed inside of the upper teeth before the injury, but now projected beyond them for more than a quarter of an inch; it was not possible, under the circumstances of the case, to reduce this displacement, and much less to retain it in place by any means ordinarily adopted.

“September 3d.—Tongue much swollen, and parts quite sensitive to any kind of disturbance. In consultation with surgeons Bemiss, Gamble, Green, and others, it was determined, on account of the wounding of the ranal artery, to leave the case undisturbed for a day or two longer, but in the mean time to construct the necessary apparatus for the treatment.

“September 4th.—Tongue much swollen; patient still unable to articulate; communicates his wishes entirely by writing.

“September 5th.—Swelling somewhat subsided; no signs of hæmorrhage; patient able to swallow milk and other liquid food with comparative ease; made wax impressions of upper teeth, and of each fragment separately of lower jaw.

“September 6th.—Patient still improving, yet no disposition to a self-adjustment of the fragment; made proper measurements, and proceeded with the manufacture of the splint.

“September 8th.—Some small spiculæ of bone removed, and the position and condition of the fragment carefully examined. The surgical treatment being intrusted to surgeons Bemiss and Lundy, but little notice was taken of the symptoms.

“September 10th.—Applied interdental splint, and found the displacement of the lower fragment so great, that the teeth could not be made to occupy their places in the splint. The fragment being quite movable, it was lifted and forced somewhat outwardly, and the tube of a syringe introduced between the bicuspid of the right side and the fracture. The wound was then carefully but freely syringed with tepid water, in order to remove the debris that was supposed to be interposed between the apices of the fangs of the teeth and their respective positions in the lower fragment. By carefully introducing a curved instrument (an aneurism needle) between the bicuspid on the right, and another beyond the bicuspid on the left, the fragment was then lifted upward, pressed backward, and forced into position. The splint was then applied, the teeth

forced into their places, and the whole confined, by means of the mental compress and the occipito-frontal bandage. This operation caused some pain to the patient, but it was by no means severe.

“September 11th.—Teeth are well adjusted in the splint and are in perfect position; patient quite easy, and able to imbibe liquid food with facility.

“September 15th.—Swelling very much subsided; external wound healing.

“September 20th.—Fragments in perfect position and not at all displaced, on the removal of the splint.

“November 1st.—Fragment perfectly united and patient able to use the teeth, these being quite firm; no deformity exists, and speech is but little impaired; external wound scarcely noticeable; artificial substitutes, for the lost teeth, will doubtless entirely restore the speech.”

Reproduction of Bone.—In an abstract of the proceedings of the Wayne Co. (Ind.) Med. Soc. by the Secretary, Dr. W. P. WARING, *Cincinnati Lancet and Obs.*, it is stated that “Dr. Wiest read an elaborate and interesting paper on the repair and reproduction of bone. He referred to the various opinions assumed and held by pathologists in regard to this important process, and in conclusion, satisfactorily established the points aimed at, viz., that it is the periosteum which produces the osseous structures, that it will almost always do it under favorable circumstances, and that in all operations where we wish bone reproduced, it is of paramount importance to preserve intact every particle of this membrane.”

Reproduction of Parts of Animals.—M. GROSS says: ‘If one cuts off the foot of a salamander, the next day the wound is covered with epidermis cells; two days after the amputation, an amorphous substance is poured out between the epidermic layer and the solution of continuity, and in five or six days this amorphous substance, semi-transparent, has pushed off the epidermis, and formed a kind of cap at the end of the member.’ The author says that the phases of the new foot resemble those through which the member removed had gone in its growth. ‘In the semi-transparent substance which is found between the epidermis and the solution of continuity, is instantly recognized an amorphous substance and granular matter, besides embryo-plastic nuclei; these nuclei, much larger than in the human subject, always precede the reproduction, as they precede formation of tissues in the embryo.

“From the fifth day after the amputation nuclei are found, which change into fusiform bodies, and, soon after, laminar fibres appear. Between the tenth and the fifteenth days the nuclei of cartilage are to be seen near the bone which has been divided. About the twentieth, a cartilaginous cone, continuous with the old bone, is found; the end of the bone is inserted in the cartilage; the reproduction of the cartilage proceeds gradually to the extremity of the member, of which it seems to guide the development; in fact, it precedes the formation of the muscles and nerves. The cartilaginous skeleton of the part is at first of a single piece, though the forms are already pretty plainly seen; the articulations appear little by little, beginning where the reproduction has begun. In a month and a half the articulations are formed, and ossification commences.

“The development of the muscles is easily followed; nuclei in rows produce the new myolemma, which is perfectly continuous with the old, and is plainly visible by about the fifteenth day; after a month, fresh nuclei appear within the myolemma to produce the muscular fibres.

“The nerves are thus developed: in the early days following the amputation the ends of the divided nerves undergo fatty degeneration, but not to any great extent; after ten days rather lengthened nuclei are seen close together at the sides and in front of the stump; these nuclei, surrounded by an amorphous yellowish substance, form a kind of fusiform body, whose slender extremities reunite to form the fibres of Remak, which soon become nerve-tubes.’

“The author, further on, says that ‘the conditions necessary for animal reproduction are contrary to the union by first intention, and *vice versa*.’”—(*Gazette Médicale de Paris*, and *Brit. and For. Med.-Chir. Rev.*)

“*Animal Grafts.*—M. PAUL BERT informs the French Academy of fresh experiments in grafting the tails of rats upon other rats. He finds that his curious process has succeeded after certain tails have been removed from the animals to which they belonged, and placed under the following conditions: 1. Exposed to the action of air in a closed tube for seventy-two hours, at a temperature of 44° to 46° F. 2. After exposure to a humid heat of 135° F. 3. After exposure to a temperature of 3° F. 4. After complete desiccation. 5. After complete desiccation, and exposure to dry heat of 212° F. The so-called ‘complete desiccation’ was effected in *vacuo*.”—(*Intellectual Observer*.)

“*Increase of Syphilitic Affections of the Mucous Membrane of the Mouth.* By Prof. SIGMUND.—Not only is syphilis yearly on the increase, Prof. Sigmund observes, but of late he has met with a more than proportionate increase of the forms of it which affect the mucous membrane of the lips, cheeks, tongue, and palate. The papular infiltrated form is that which usually prevails, being often accompanied by more or less well-defined excoriations or chaps, sores accompanied by induration being much seldomer met with. In fact, the forms accompanying the earlier stages of syphilis have been of much more frequent occurrence than those of a later epoch, although in some instances there has been seen the dry, inelastic condition of the mucous membrane, with disposition to crack and peel off, characterizing old syphilides.

“In one set of the cases a careful examination readily detects signs of syphilis in other parts of the body; but in others the existence of such cannot be demonstrated, and there seems every probability, or even certainty, that the buccal mucous membrane is the original seat of the disease. The first group of cases presents no great difficulties, as, other signs being detected, this affection of the mouth resolves itself into one of the symptoms of constitutional syphilis. Some of these cases, however, present more difficulties, especially in children, in whom a decision is often of great importance as to whether the syphilitic contagion has been conveyed by the nurse to the child, or the reverse, a probability only being attainable where the condition of the mother cannot be examined into. Some of the adults attributed their sore mouth to smoking poisoned cigars; but even the patients themselves became convinced of the ground-

lessness of their belief by the exhibition of the signs of syphilis which existed on other parts of the body. Some years since a similar charge was brought against the cigars of a particular factory, and was disproved not only in the same way, but by the examination of several hundred women engaged in the factory, not one of whom, strange to say, manifested any signs of syphilis.

"In the second group are comprised those patients in whom the buccal mucous membrane alone exhibits the signs of syphilis usually met with in the sexual organs, the anus, and its vicinity, but which in these cases manifest no traces of disease. It is to be observed, however, that for the most part they rapidly disappear, sometimes leaving no marks of their existence. In some of these cases the mode of communication may be ascertained, this being sometimes immediate from the diseased to the healthy individual by smoking, kissing, etc., and sometimes mediate through the use of various drinking or eating utensils, tobacco pipes, etc.; and although some of the statements to this effect are to be received with incredulity, yet repeated observation has shown that the employing of common blowing instruments, etc. by barometer makers and musicians, may become the means of conveying syphilitic poison to the mucous membrane of the mouth."—(*Wien Med. Wochenschrift* and *Brit. and For. Med.-Chir. Rev.*)

Nitrous Oxide Gas in Operative Surgery.—In relation to Dr. Carnochan's note respecting the first anæsthetic use of nitrous oxide in capital operations, Dr. P. W. ELLSWORTH, of Hartford, Conn., thus writes to the *Med. and Surg. Reporter*: "By turning to pages 52 to 68 of the work called *Anæsthesia*, published in 1859 by Hon. Truman Smith, in defense of Wells before Congress, you will find a full account of an amputation performed by me, in 1848, 18 years ago—with a success fully equal to that attained since, either by gas or chloroform. This was the first amputation. The same reasons are there given for preferring the gas to other anæsthetics, which are urged by Dr. Carnochan. Probably he was unaware of this operation when he made the statement. In that case Wells himself gave the gas."

Nitrous Oxide Gas in Capital Operations.—In response to the above, PROF. CARNOCHAN says (*Med. and Surg. Reporter*, February 10th): "I observe in your last number, January 27th, a communication from Dr. Ellsworth, of Hartford, in which he states that I was in error in supposing that I was the first to perform a capital surgical operation under the influence of nitrous oxide gas, as he had amputated a limb eighteen years ago, Dr. Wells himself administering the gas. I was aware, when I wrote my letter on this subject, that one or more surgical operations had been performed in Hartford, about the time of Wells' discovery. I therefore, if you will observe, distinctly stated that mine are the first capital operations performed under the influence of the gas *since* the discovery of Wells, meaning since that epoch. I did not lay claim to any priority in the use of the gas, nor to any particular merit except that of reviving its use for surgical purposes, after it had been abandoned in favor of chloroform and ether for nearly eighteen years, and proving and corroborating the fact that it is preferable to either, and perfectly suitable for all surgical operations of short duration.

"I am pleased to find that so distinguished a surgeon as Dr. Ells-

worth should have been one of the first to practically demonstrate the anæsthetic qualities of nitrous oxide gas in surgery proper.

"Since my letter in December, I have performed four more capital operations upon adults, viz., one amputation of the thigh, one of the leg, the removal of a tumor from the side, and the extraction of a cataract, making in all, since last July, seven successful capital operations under the influence of anæsthesia produced by the nitrous oxide gas. I have also, during this time, used chloroform and ether in many operations, and my opinion in regard to the superiority of the nitrous oxide as an anæsthetic, is still unchanged. I believe, however, that there is great room for improvement in the mode of administration of the gas; one principal fault at present being the repeated inhalation of the same material. An instrument which will act by a valvular arrangement, as in Reed's stomach-pump, would obviate this difficulty, and I have no doubt but that some skillful mechanic will produce one that will meet the necessary requirements.

"The necessity which exists for some anæsthetic agent which will enable the patient to place himself in the hands of the operator without fear of the unpleasant, dangerous, and sometimes fatal effects of chloroform and sulphuric ether, renders the consideration of this subject a matter of much importance to the profession and to the world at large, and the elucidation and record of new facts connected with it may be made the basis of future improvements.

"With the exception of the undoubted claim which Wells has to the discovery of anæsthesia for surgical purposes, I regard the historical part of the subject as of comparatively small import. As the matter now stands, however, by reference to Senator Truman Smith's Congressional report, referred to by Dr. Ellsworth, I find that on August 17th, 1847, Dr. E. E. Marcy, then of Hartford, now of this city, removed a scirrhus testicle; that on January 1st, 1848, Dr. P. W. Ellsworth, of Hartford, performed an amputation of the thigh on a boy, and that, three days after, Dr. S. B. Beresford, of the same place, removed an adipose tumor, six ounces in weight, from the shoulder of an adult.

"Since these operations, performed at the time of Wells' discovery, nitrous oxide gas, as an anæsthetic, has been absolutely abandoned in capital surgery, until my operation, the extirpation of a cancerous mammary tumor, with enlarged cancerous glands in the axilla, on the 22d of July, 1865, an interval of about eighteen years. The period of time (sixteen minutes) that the patient was kept under the influence of the gas, during that operation, is, as far as I know, the longest on record. I must state, however, that during this time, the bag containing the gas was removed several times from the mouth of the patient, in order that the lungs might be injected with atmospheric air.

"The subject now remains open for future experiment to develop the further capabilities of the nitrous oxide gas as an anæsthetic agent."

Nitrous Oxide Anæsthesia.—Dr. CHAS. H. SHEARS, of Sharon, Ct., thus replies to a query in the *Med. and Surg. Reporter* of "what becomes, in the now increasing and successful use of nitrous oxide in surgery, of the wild excitement familiar to every student of chemistry?

"The gas may be given so as to produce 'wild excitement;' or it may

be administered so as to produce perfect anæsthesia in about one minute. This difference in the effects of the gas, is found in the *quantity* given and in the *manner* of administering it. Your chemist, who gives it to his student for amusement, uses a small bag of the capacity of two or three gallons, with a mouth-piece of small calibre, and allows the air to mingle with the gas in the lungs.

"Now, if instead of this miniature apparatus you use a six or eight gallon bag with a mouth-piece having a calibre of at least five-eighths of an inch, and having closed the nostrils of the patient, introduce the mouth-piece after an expiration, taking care that the lips are perfectly closed around it, so that no air shall enter, you will have no 'wild excitement,' but perfect anæsthesia."

Dangerous Effects of Nitrous Oxide.—In a communication to the *Med. and Surg. Rept.*, respecting a case of death from chloroform, Dr. W. P. MOON thus incidentally alludes to the dangerous effects of nitrous oxide: "In witnessing the exhibition of anæsthesia by nitrous oxide gas, on one occasion, at the Pennsylvania Hospital, I think a patient was as nearly dead as I should care to see any one, and have my doubts if it is without its dangers, either through unskillful management or improperly-prepared gas. Should it prove what its advocates claim for it, and become more readily used by improved means of administration, it will be a greater blessing than we now possess in chloroform or sulphuric ether."

"Galvanic Soldering."—Under the name of 'galvanic soldering,' a process is known by means of which two pieces of metal may be united by means of another metal, which is precipitated thereon through the agency of a galvanic current. This mode of soldering by the 'wet method' has been often recommended in various periodicals relating to the industrial arts; but it has been objected that, practically speaking, the union between two pieces of metal could not be effected by means of a metal precipitated by galvanic agency. In order, however, to arrive at a definite conclusion upon this question, M. Elsner undertook the following experiments, the results of which are in favor of the practical use of the operation of soldering by galvanic agency:

"In conducting these experiments, the kind of battery known as Daniell's 'constant battery' was employed; and upon the end of the copper wire, which formed the negative electrode, a strong ring of sheet-copper was placed. This ring was cut asunder at one point, and the distance left between the severed parts was about the sixtieth of an inch. At the end of a few days (during which time the exciting liquors were several times renewed) the space in the severed portion of the ring was completely filled up with copper regulus, which had been precipitated; and on partially cutting with a file through the part thus filled up, and examining it with a lens, it was observed to be very equally filled with solid and coherent copper.

"Another copper ring was then cut into two parts, and the two semi-annular segments thus obtained were placed with the faces of the sections opposite each other, and submitted to the action of a galvanic current. At the end of a few days, the segments were united by the copper pre-

cipitated, thus forming again a complete ring. It was also found in this case, on removing with a file a portion of the thickness of the ring at the points of contact, that the spaces had been completely filled up by copper galvanically precipitated, which had united the whole. On observing these points carefully with a lens, the regular deposition of the copper could be readily traced between the formerly separated portions of the ring.

"A third experiment was made in the following manner: Two strong rings of sheet-copper were laid with their freshly-cut faces one upon another, so that the two rings constituted a cylinder. These rings were surrounded by a band of sheet-tin, which was coated with a solution of wax, so that the two rings were equally surrounded by a conducting material. Thus disposed, these rings were attached to the negative wire of the battery, and immersed in the bath of sulphate of copper. At the end of a few days, the interior surface of the rings was covered with precipitated copper, and between the contact surfaces of the two rings copper was also precipitated. These rings had only been submitted to the galvanic current to such an extent as to cover their interior surface with a thin coating of precipitated copper, and yet they were already completely reunited, and formed a cylinder consisting of a single piece. The exterior conducting covering, consisting of a sheet of tin, was of course removed before testing the cohesion or persistence of the galvanic precipitate. It may be remarked that these rings, after being for a certain time in contact (during the galvanic action), together with the plate of copper upon which they rested, became so incrustated with precipitated metallic copper that some force was found necessary to effect their detachment from the copper wire.

"There would appear to be no doubt, then, according to the results obtained in the preceding experiments, that two pieces of metal may be firmly united by means of galvanically-precipitated copper; in a word, that soldering by galvanic agency is perfectly practicable. It will, therefore, be possible to firmly unite the different parts of a large piece of metal, and to make a perfect figure of them by galvanic precipitation of a metal (copper, in ordinary cases). If solutions of salts of gold or silver were employed in as concentrated a form as those of copper above mentioned, there is reason to believe that galvanic soldering would also result. In fact, M. de Hackewitz states, that in some experiments on a larger scale which he undertook, to obtain hollow figures by galvanoplastic means, he had remarked that galvanic union often took place between the pieces operated upon. M. Elsner states, that while conducting the experiments above mentioned, he remarked that, by employing too powerful a current, the negative electrodes of copper, and even the plate of copper, and ring of the same metal resting thereon, became covered with a deep brown substance, in the same manner as this occurs under similar circumstances in galvanic gilding, as is well known. After several unsuccessful attempts to prevent the formation of this brown coating, M. Elsner found that it was possible to remove it entirely on immersing the articles covered therewith, during a few seconds, in a mixture of sulphuric and nitric acids. By this means the precipitated copper was made to assume its natural red color. The possibility of practically effecting the operation of soldering by galvanic agency may be explained in a few words, in a theoretical point of view. The article is, in fact, in an electro-negative state of excitation, while the zinc operates positively; the

result is, that the faces which are placed opposite each other, when the ring has been cut, are negative; that is to say, in an electric condition of the same denomination. During the progress of the electrolytic decomposition of the metallic salt in solution (sulphate of copper in the above case), the electro-positive molecules of copper which are detached simultaneously arrange themselves upon the two opposite faces, and in the direction of the break. Now, from the moment that these molecules are deposited they constitute, with the piece, a homogeneous mass; and from that time act negatively upon the copper which is contained in the solution, and again precipitate copper in the form of regulus. This method of operation continues until the space which existed between the two separate pieces of metal is filled up with metallic copper; in fact, the layers of copper which become deposited in an equal manner upon the contiguous faces of the metal, gradually diminish the distance which separated the latter, until at length the metallic layers which cross in the opposite direction meet each other; the result being that the whole of the break which originally existed between the faces will have disappeared, and become filled up with copper.

"With respect to the solidity (the degree of cohesion) of the galvanic soldering, it is the same as that of copper or other metal precipitated by galvanic agency. It will, moreover, be well understood, that too energetic galvanic excitation must have an injurious influence upon the cohesion of the metal precipitated; and in this case precisely the same phenomena will be observed as those which have long manifested themselves in ordinary galvano-plastic operations."—(*Technologist and American Artisan.*)

Solvent for Shellac.—A subscriber writes to the *Sci. Amer.* that spirits of hartshorn or caustic ammonia "will dissolve shellac easily within a few hours." It is said to make a perfect solution, and as it evaporates rapidly, to be a good substitute for alcohol.

BIBLIOGRAPHICAL.

The Richmond Medical Journal. E. S. GAILLARD, M.D., and W. S. MCCHESENEY, M.D., Editors and publishers: Richmond, Va. Five dollars per annum in advance.

We have received the first two numbers of this neat and well edited monthly. It is filled with interesting and useful matter and is well worthy the support of the profession. We place it on our exchange list with pleasure.

The Journal of Materia Medica, devoted to Materia Medica, Pharmacology, and Chemistry. Conducted by JOSEPH BATES, M.D., and H. A. TILDEN: New Lebanon, N. Y. Monthly, one dollar per annum in advance.

We are also in receipt of numbers one and two, vol. v., of this excellent journal, which we are pleased to see has been revived, and hope it may long continue its career of usefulness.

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, APRIL, 1866.

No. 9.

ORIGINAL COMMUNICATIONS.

MICROSCOPY OF THE DENTAL TISSUES.

BY J. H. M'QUILLEN, D.D.S.,

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An Address delivered before the Connecticut State Dental Association, October 4th, 1865.

Gentlemen:—When accepting the invitation to deliver an address before your body, I concluded to make the MICROSCOPY OF THE DENTAL TISSUES the theme for consideration, under the impression that it would prove alike interesting, instructive, and a prolific source of investigation to all. And although many writers and observers are disposed to regard the subject as one that has been so thoroughly examined that it is impossible to throw additional light upon it by continued research, yet all accurate observers and thinkers must admit that there still remains “ample scope and verge enough” to whet the appetite of the earnest inquirer in this direction. The celebrated JOHN HUNTER, in preparing his work on the NATURAL HISTORY OF THE HUMAN TEETH, no doubt supposed that he had exhausted the subject; and yet who to-day would agree with him in the assertion that “a tooth is composed of *two substances*, enamel and bone;” or be satisfied with the description which he gives of the different tissues which enter into the formation of the dental organs? I do not wish to be understood as underrating his valuable contributions to our specialty; but, on the contrary, appreciating them most highly, and fully recognizing the impulse they gave toward raising our calling from a mere handicraft to the position of a liberal profession, I yet cannot refrain from expressing the opinion, that had he availed himself of the aid of the microscope (that wonderful instrument which has revealed during the past half a century so much of the minute structure of organic bodies that is hidden from the naked eye), his work, in place of being laid on the shelf as a curious and truly wonderful production as far as it

goes, would still be used as a valuable text-book. It may be said that microscopic research in his day was not prosecuted with the same vigor that it has been during the past fifty years; while this is true, the fact must not be lost sight of, that ANTON VAN LEEUWENHOEK, as early as the period between 1632-1723, with the assistance of magnifying glasses, powerful though of very simple form, discovered and described the dentinal tubuli. Yet, notwithstanding the valuable assistance that was here afforded to him by the labors of another, Hunter, evidently owing to a want of familiarity with all the literature of the subject, contenting himself with the description of the gross anatomy of the jaws and teeth, permitted the opportunity to pass by for a thorough account of the minute structure of the organs, and thus left the field entirely open for the valuable efforts of RETZIUS, OWEN, NASMYTH, TOMES, and KÖLLIKER, whose contributions in this field will ever be regarded as inestimable additions to the domain of science. Let the remembrance of the fact just referred to be to each and all of us a constant incentive to exertion, not only to become *observers*, but also familiar with the *entire* literature of a subject, and thus avoid falling into the error of supposing that having made some advance in any given direction, we have therefore mastered and exhausted the theme.

The subject is not merely interesting and important to us as professional men, but to the naturalist, who, in the classification of animated nature from the days of CUVIER, has made the *general* form of the teeth one of the most important guides in determining what position should be assigned to different animals in the Zoological series, a thorough knowledge of this subject is equally indispensable in ascertaining the nature, affinities, and position of extinct species, of whose organization, on account of the greater durability of the dental tissues, they are frequently all that remains in the geological strata. Possessing such knowledge, the paleontologist, with the aid of the microscope, has been able to decide questions which were not only attractive from the scientific interest attached to them, but also vastly important on account of large pecuniary interests involved in their solution.*

* In confirmation of the above, the following is appended: "It was in regard to *Teeth* that the possibility of such determinations was first made clear by the laborious researches of Prof. Owen; and the following may be given as examples of their value: A rocky formation extends over many parts of Russia, whose mineral characters might justify its being likened either to the *Old* or to the *New Red Sandstone* of this country, and whose position relatively to other strata is such, that there is great difficulty in obtaining evidence from the usual sources as to its place in the series. Hence, the only hope of settling this question (which was one of great practical importance, since, if the formation were *new red*, Coal might be expected to underlie it, whilst if *old red*, no reasonable hope of coal could be entertained) lay in the determination of the Organic remains which this stratum might yield; but unfortunately these were few and fragmentary, consisting chiefly of teeth, which

In inviting your attention to the Microscopy of the Dental Tissues, I do not propose to offer to you any discoveries of my own, but rather to describe in a plain, and, I trust, comprehensive manner, the characteristic peculiarities of the tissues which enter into the composition of the dental organs. In doing this, however, I shall present that which I have *seen* myself and *shown* to you, for as you are well aware a large number of valuable sections of the teeth of man and animals and also of bone were exhibited to you under the microscope last evening; these, in connection with the drawings which are suspended in the room, will, I trust, enable me to make the subject more clear and intelligible to you than could have been the case without them. The limited period which is afforded me only admits, I regret to say, of a hasty survey of the subject; yet I trust the time, however, will not be misspent, but may be the means of inducing you, as already remarked, to examine the subject yourself with the aid of good instruments, and thus *confirm* or *correct* the statements of other observers. In this connection, let me say, it is not absolutely necessary that you should invest a large sum of money in the purchase of a microscope, for with from sixty to one hundred and twenty-five dollars an instrument can be procured adapted to all practical purposes; and with such as these some of the most important and valuable discoveries have been made. Every Dental Society should have a microscope.

With these preliminary remarks, the teeth may be defined as small, hard, white bodies found implanted in the alveolar processes of the superior and inferior maxillary bones in man and the mammalia generally; while in other portions of the animal kingdom supplied with these organs they occupy various positions in the alimentary canal, extending in some instances from the mouth to the pylorus. In man, as you are well aware, the number of permanent teeth is thirty-two, but the *typical* number of the *vertebrata* is forty-four, and in the series it varies from a single tooth to as high as one hundred and forty. Varying thus in number and position they also differ in shape, size, and microscopical structure, and in the relations which the different tissues that enter into their com-

are seldom perfectly preserved. From the gigantic size of these teeth, together with their form, it was at first inferred that they belonged to Saurian Reptiles, in which case the sandstone must have been considered as New Red; but microscopic examination of their intimate structure unmistakably proved them to belong to a genus of Fishes (*Dendrodus*), which is exclusively Palæozoic, and thus decided that the formation must be Old Red. So, again, the microscopic examination of certain fragments of teeth found in a Sandstone of Warwickshire, disclosed a most remarkable type of tooth-structure, which was also ascertained to exist in certain teeth that had been discovered in the 'keuper-sandstein' of Wirtemberg; and the identity or close resemblance of the animals to which these teeth belonged having been thus established, it became almost certain that the Warwickshire and Wirtemberg sandstones were equivalent formations, a point of much geological importance."

—Carpenter on the Microscope, page 641.

position bear to each other, but having reference under all circumstances, however, to the *habits* and *food* of the animal; for the teeth, as the primary agents in the assimilation of the food, serve to prepare it by mastication for the important changes which it undergoes in the rest of the nutritive system.

Although presenting a variety of shapes, the general form of the teeth is either conical, wedge-like, or a combination of both. As the time allotted does not permit me to describe the shape of the different classes of teeth, I will merely state that the body of each tooth is divisible into three sections: one part projecting above the mucous membrane or gum, the *crown*; another portion received or implanted in the alveolar socket or *alveolus*, the *root*; and a line of demarkation, not always strongly marked, between these two, the *neck*.

If a recent human tooth, an incisor for instance, is divided longitudinally, a chamber called the pulp cavity, corresponding with the shape of the tooth and occupied by a soft and highly vascular substance, the dental pulp, richly supplied with vessels and nerves that have entered a foramen at the end of the root, will be brought into view. In addition to this, the exterior of the root will be found invested by a soft fibrous structure, the periodontal membrane. These constitute the soft tissues of the tooth. On examining the solid portion of the tooth with respect to its component tissues, it will present at least *three* distinct structures: viz., 1, a yellowish-white substance constituting the greater portion of the body of the tooth, the DENTINE; 2, a hard, vitreous, translucent substance investing the crown, the ENAMEL; 3, a cortical structure generally disposed in a thin layer around the root, the CEMENTUM. In addition to these a fourth substance is not unfrequently observable intermediate between dentine and bone, the OSTEO-DENTINE of OWEN, or the SECONDARY DENTINE of TOMES.

FIG. 1.



As a primary object in this address is to induce you to become observers, it is advisable at this point to describe how microscopical sections of

hard structures like bone and the dental tissues are made; for the errors into which investigators have frequently fallen have been due either to the employment of defective instruments, or the imperfect manner in which the preparations under examination have been made. The necessary appliances for the accomplishment of this purpose are, a fine watch-spring saw, files, and water of ayr-stones; or, what is still better

for the purpose, as it will effect the work much more rapidly, a lathe, to which can be adjusted a disk of soft iron like that used by the lapidary, charged at its end with diamond dust, corundum wheels, and Arkansas stones, for the purpose of making and polishing sections of the substance to be examined. In addition, oblong slips of plate-glass that should be clear, free from veins and bubbles (on which the preparations are to be placed, and very thin glass for covering them, which can be obtained from opticians), of a standard form and size, agreed upon by microscopists, along with Canada balsam and a spirit-lamp, are required.

The first thing to be done in the preparation of a specimen, is to obtain a longitudinal or transverse section as thin as it can be safely cut with the saw or circular disk. This section is then attached to a slip of well-annealed glass with Canada balsam, and filed or ground down until it becomes translucent, care being taken to have the pressure applied with such equality that the thickness of the section shall be the same in its entire structure. By occasionally examining it under the microscope during this process, any inequalities that may be present can be detected. Having obtained a perfectly smooth and polished surface, by gently warming the glass, the section can be detached, and, with the finished surface turned downward, may be transferred to the permanent glass slide, to which it is to be united by Canada balsam. The upper surface of the section is then treated in the same manner as the opposite surface was, until a perfect microscopical section is obtained, when it should be covered with the thin glass, and the latter secured in position by a black cement surrounding its edge. In using the balsam, great care should be exercised to prevent the formation of air-bubbles, as these injure the appearance of the specimen, and the true character of the structure cannot be made out with any satisfaction. This can be best effected by placing a drop of balsam on the glass slide, and then, holding the latter over the flame of the spirit-lamp, when this becomes sufficiently warm, the object can be brought in contact with the balsam, and pressed evenly and gently against the glass. In placing the thin glass cover in position, it should first be warmed on the under surface before it is laid over the specimen: if this does not suffice to attach it, the under surface of the slide can be warmed so as to soften the balsam. Care should be exercised, however, not to apply too high a heat in this operation, as it may cause the specimen to curl up, and destroy its usefulness for microscopical examination.

An easier method of obtaining sections than that described above, is to place a tooth in the lathe and make shavings of it with a thin, sharp, and well-tempered chisel, or to put a tooth, that has been slightly softened by acid, in a vice, and then take off thin slices with a sharp razor.

Those who may not feel inclined to incur the time and trouble incident to the preparation and mounting of specimens, can procure good ones at

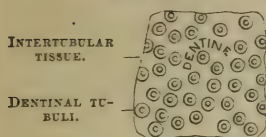
a trifling cost from prominent opticians in our large cities. Those, however, who purpose to carry out a line of investigation for themselves, cannot depend entirely upon such sources, but must frequently rely on their own efforts in the preparation of specimens, and hence the importance of knowing how to make them.

Having secured a longitudinal section of a human tooth, it is found to be made up of three distinct structures, of which the first is a substance, now to be described, named, by PROF. OWEN,

DENTINE.—This tissue, which was formerly called *ivory* or *tooth substance*, constituting the greater part of the crown and root of a tooth, giving to it its general form, and inclosing the pulp cavity, is in a perfect human tooth never exposed at any point, but is perfectly protected from the influence of external agents by the dense and impermeable enamel covering the crown and extending by a thin layer to the neck; where this ceases, the cementum commences to invest the root. The satiny aspect which a section of dentine presents to the naked eye gives it the appearance of a perfectly compact solid structure, but under the microscope it is found to consist of a multitude of fine canals, the **DENTINAL TUBULI**, and a connective matrix or intervening substance, the **INTERTUBULAR TISSUE**.

The **DENTINAL TUBULI** are generally described by microscopists as having distinct parietes or walls, formed of harder material than the *intertubular tissue*, whose thickness is much less than the diameter

FIG. 2.



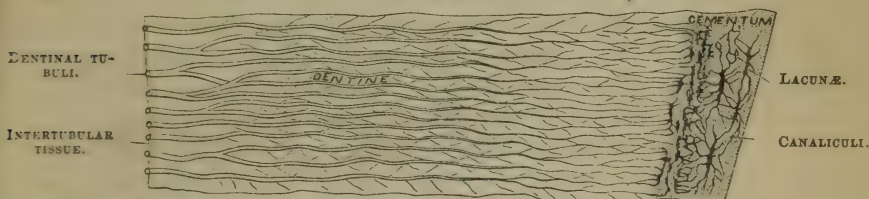
of the tubuli, which, in the largest, according to **TOMES**, is about $\frac{1}{10000}$ of an inch. It is difficult to distinguish these walls in longitudinal sections, but in *transverse* sections what appears to be a narrow ring is readily observable surrounding each tubule. Whether this is an optical illusion induced by the wavy character

of the *secondary curvatures* of the tubuli, is a matter of question with many. Be this as it may, there can be no doubt entertained by any one at the present time relative to the fallacy of the opinion advanced by **NASMYTH**, that the *tubuli* are not canals but *solid fibres*, with brick-shaped cells built around them. How this distinguished and laborious observer could have been led into such an error is difficult to conceive, as the tubular character is readily demonstrable by the passage of colored fluids and minute bubbles of air along them.

The **TUBULI** originate by open mouths on the walls of the pulp cavity, and proceed in a slightly wavy and radiated manner through every portion of the dentine to its periphery, where they generally terminate, although in some instances extending beyond and penetrating the enamel or the cementum, in the latter of which they communicate with the *lacunæ* through the *canaliculi*. Toward the masticating surface of the crown,

where the occlusion of an antagonizing tooth has to be received, they are vertical, or nearly so, and horizontal where the pressure of contiguous teeth has to be resisted; by this arrangement a certain amount of elasticity is gained, and the shock of occlusion and pressure is more generally distributed over the entire structure. The wavy character of the tubuli above referred to consists of two or three large or *primary curvatures*, and a number of smaller or *secondary curvatures*, which follow closely upon each other, and are estimated by RETZIUS as numerous as two hundred in a single line.

FIG. 3.



VERTICAL SECTION OF THE ROOT OF A CANINE TOOTH. (AFTER LEIDY.)

Starting from the pulp cavity in close proximity to each other, the divergence of adjacent tubuli is so slightly apparent, that they seem to run parallel with each other. In following them out, however, toward the periphery of the dentine, the divergence in the *crown* is readily observable on account of the increased distance between them and the ultimate dichotomous division, without at first much diminution in the caliber of the tubes. These branchings increase in number and decrease in size the nearer they approach the periphery of the dentine, and they either anastomose with each other, pass into the enamel or cementum, terminate abruptly, or in very minute cells. In addition to the large branches just referred to, innumerable fine branches are given off from the sides of the tubuli, which penetrate the intertubular tissue and anastomose with each other. In this way the most perfect arrangement for the passage of that nutrient fluid, the *liquor sanguinis*, to every portion of the tissue, is effected.

(To be continued.)

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from p. 404.)

Osteo-sarcoma.—However much—and it may be justly—the term osteo-sarcoma is abused, it still manages to hold its place in surgical nomenclature. Employed indiscriminately, as it long has been, it must certainly be perplexing enough to that class of professional men who study names and shadows rather than the substance of things; for, like the word *epulis*,

osteo-sarcoma has been made to represent the most unlike pathological conditions and the greatest diversity of features.

The term, as is seen, is a hyphen, and is derived from the Greek *ὀστέον*, signifying bone, and *σάρξ*, meaning flesh; and by those who created the term, could only have been intended to stand as the representative of a class of tumors which were flesh-like in appearance, either fleshy tumors in or upon bony structures, or a transformation of bone into fleshy substance.

I cannot say that, to me, the term seems such an ill one: it is certainly expressive; it is no fault of the word that men will misuse it. Be it as it may, however, there are so great a number of oral tumors which are made to come within its classification, that no direction of our study demands from us a closer understanding; and such understanding implies that we should look at the subject from every stand-point.

Osteo-sarcoma cannot, from its origin, apply to a strictly special disease; it is a noun of multitude, just as is *epulis* when it is used as a noun. We speak of the human face when we would direct attention to the countenance; so, also, we speak of the face of a landscape, the face of the moon, or the face of things generally. Now, the word face is, without doubt, a very admirable word, but still it tells nothing of the many different kinds of faces. To be special, it must have some adjectival prefix. With such prefix, we get every proper meaning for the word, and can employ it freely to our own satisfaction, and to the making of ourselves perfectly understood by others. Thus, we say of one man that he has a bright face; of another, that he has a dull face, etc. Osteo-sarcomatous requires equal latitude. Thus we have a fleshy-looking tumor which is benign; and we have another which is malignant. Both of them are sarcomatous, inasmuch as they are flesh-like; yet they are very different kinds of tumors, so far as a prognosis would be concerned.

By the term "flesh-like," I do not, however, understand that muscle-like structure was specially implied; for all descriptions, however far back I have been able to go, seem to refer rather to fibrous tissue.

Prof. Gross, speaking of the diseases of the maxillary bones, which seem to require the operation of excision, says: They—the diseases—are generally described under the vague and unmeaning name of osteo-sarcoma, and constitute a group of affections, defying every attempt at correct classification. That this declaration, he says, is not a mere assumption unsupported by facts, the writings of pathologists and surgeons abundantly testify.

Prof. Henry H. Smith, in his *Surgery*, page 483, thus writes on osteo-sarcoma: The bony and fleshy tumor, or osteo-sarcoma, is another ancient name, sometimes indiscriminately applied to a tumor analogous to *spina ventosa*. Both these tumors are malignant in their character, and would

be better designated as enchondromata, or as cancer of bone, the growth being generally due to a deposit of carcinomatous matter in the bone, causing an expansion both of its compact and cancellated tissue. In spina ventosa, he says, the greatest development is of the cancellated structure; while in osteo-sarcoma it is rather the compact layer and the external periosteum that are involved, the cancellated tissue being filled with a fleshy carcinomatous structure; while the enlarged cells are sometimes also filled with limited effusions of blood, or a lardaceous, soft, pulpy deposit.

Mr. Ferguson says the non-malignant or benign tumors are represented by what Mr. Abernethy calls simple sarcoma. These are tumors of a solid fleshy character throughout; or they may consist of a bag or cyst, which contains fluid, or of a combination of these two, for there may be one cyst or more in a tumor whose general character is sarcomatous; and in another case a cyst may ultimately assume the appearance of a more solid growth.

Prof. Gross, in his work, "Gross on the Bones," defines osteo-sarcoma as an alteration of the osseous tissue, in which the substance of the bone is converted into a mass more or less analogous to cancer of the soft parts. The origin, he says, is, in most cases, referable to an hereditary disposition or to external violence; it generally comes on with deep-seated, lancinating pains, which continue a considerable time before there is any evident enlargement or swelling. The form of the tumor he describes as either smooth and circumscribed, or unequal, and, as it were, tuberculated, etc. For continuation of this paper (which Prof. Gross seems in his late works to ignore, but which seems to me, in many respects, an epitome of the subject), see his book, page 181.

Eustachius speaks of certain calcareous concretions deposited about the necks of the teeth (tartar or salivary calculi evidently), and Manget classes such concretions with the sarcomatous growths.

Prof. Dunglison, in his dictionary, defines osteo-sarcoma as a disease of the bony system, which consists in softening of its laminæ, and their transformation into a fleshy substance analogous to that of cancer, accompanied with general symptoms of cancerous affection.

Mr. Paget says the name of cartilaginous tumor may be given to those which Miller, in one of the most elaborate portions of his works on cancer, has named enchondroma. In a foot-note Mr. Paget says another name employed for these tumors is benign osteo-sarcoma. In a second foot-note he says, under the vague name osteo-sarcoma many include together and seem to identify all growths in which bone is mingled with softer tissue.

Miller, in his "Principles of Surgery," says: By the term osteo-sarcoma is understood a tumor composed partly of bone and partly of fleshy substance, as the name implies: the latter constituent of a simple, non-malignant character. The formation is usually attributable to

external injury, perhaps slight, and originates in the cancellous texture of the bone. The osseous part is analogous to the fibrous interlacement in tumors of the soft parts. It is, as it were, the stroma, in which the other constituent is deposited, dense and solid, centrally radiating in spicula outward, which always diverge and interlace, leaving interstices more or less wide, in which the fleshy substance is deposited, etc. See page 442 for differences, as given by this author, between osteo-sarcoma and enchondroma and osteo-cephaloma, etc.

Lebert places the whole class among the cancrioid growths, and denies that tendency to return furnishes any sufficient evidence of a cancerous origin.

Miller, in another part of his "Principles of Surgery," says he desires candidly to admit that the class is "not certainly a well-defined one." It has been doubted, he says, whether some variety of these fibro-plastic growths would not be more properly classed among the malignant tumors, as they have been found prone to return, after excision, with singular obstinacy.

Spina ventosa, as remarked by Prof. Smith, is freely enough confounded with the osteo-sarcomatous growths. Now, the first is a term meant to imply an empty cyst, such as in a previous paper I described as simple cysts: 'Ventosa, a word from Arabic, signifying windy; while the latter implies a solid, or a comparatively solid, tumor. This definition differs, I am aware, from that given by Prof. Smith; but I employ the term, and recognize it only in accordance with its literal meaning. Some one must take the initiative in so restricting these words, or otherwise nomenclature will always be confusing. If, then, spina ventosa means a sharply-defined empty cyst, or, to give another definition to the prefix spina, a cystic tumor accompanied with pricking pains, then it cannot simulate, so as not to be recognized.

And so I might go on through all the authors upon my shelves—each one describes the disease, but classifies it differently. A review which I made of many authors reminded me, graphically, of Brummacher's impressive anecdote of the bringing of the priests from the Babylonian war by Alexander: "Bild und Zerchen ist nicht das Wesen." But I have quoted enough—and have chosen authors presumed to be familiar to all my readers—to exhibit the confusion which exists in the nomenclature of this direction of the maxillary tumors, and to excuse me, I trust, from any appearance of egotism in choosing my own terms and my own way to describe these diseases. I do not know that I shall succeed better than many others in making myself understood, but I shall, at least, adhere strictly to the text, and map out these tumors as I have met with them in practice.

I choose then the hyphen, osteo-sarcoma, and I mean the term to apply to a class, and not a species. I mean it to stand as the representative of

any tumor in or upon the bone, which is osseo-fibrous. Let that tumor be benign or malignant—let this proposition be distinctly borne in mind.

Osteo-sarcomatous or osteo-fibrous (synonymous) tumors are to be esteemed doubtful growths. Thus I have seen two or more alike, to the unassisted eye; yet one has succumbed readily to treatment, while the others have bid defiance to every operative proceeding, and have gone on to the destruction of the patients. In minute structure (pathological character) such tumors must have, of course, varied greatly.

The fibrous tumors of the jaws, described by Mr. Paget—see his *Lectures on Surgical Pathology*, page 407—I class with the osteo-sarcomatous; so also the growth which he describes as myeloid (see same *Lectures*, page 446). Of the first, he says: As to situation and convenience, the fibrous tumors of the jaws may be found isolated and circumscribed, growing within the jaw, divorcing and expanding its walls, and capable of enucleation; but in a large number of these tumors, the periosteum, with or without the bone itself, is involved or included in the outgrowing mass. In the case of the upper jaw, either the periosteum or the fibro-mucous membrane of the antrum, or nasal walls, or both these, may be included in such a tumor. In all these cases the tumor lies close upon the bone, and cannot be cleanly, or without damage to it, separated, except on the outer surface; commonly, indeed, bony growths extend from the involved bone into the tumor; and sometimes the greater part of the bone is as if broken up in the substance of the tumor.

The character of these growths, Mr. Paget remarks, is easily recognized in the fibrous tumors of the gums and alveoli.

In my paper on the epulides, I referred to a tumor which is a fibrous outgrowth from the alveo-dental periosteum. This same class of growths spring from the lining membrane of the sinus maxillare, and, enlarging, dispart the bones, bulging out as a tumor upon the face: they are osteo-sarcomatous tumors; or perhaps it would be more correct to say sarcomatous tumors, purely fibrous in structure, and perhaps exclusively benign. Such growths, if early and properly removed, are not apt to return. I have met with these tumors over and over again; they always seemed to me to have association with the bone only, when such association was forced, as it were, on them. Such tumors are exclusively periosteal in their immediate relationship. I have examined them over and over again with the microscope, but have found them made up exclusively of simple fibrous tissues. If these tumors have not advanced too far, you will see them, on taking away the outer wall of the antrum, as some foreign body which has been impacted closely within the part; they have not the slightest pathological association with the bones, if we except their periosteal pedicle or base. Indeed, such seems the tendency to exclusiveness, on the part of these growths, that I have seen them when they were as

large as a foetal head, the integument of the cheek alone covering them, the bone which must have originally formed their external envelope having completely disappeared through absorption.*

(To be continued.)

MANIPULATION OF HARD RUBBER, WAX, AND JOINTS.

BY A. S. BAUSMAN, MINNEAPOLIS, MINN.

IN the December number of the DENTAL COSMOS there is an article by Dr. Chandler, of Boston, which contains some excellent suggestions upon this subject; but, according to my experience, some errors. Dr. C. seems to find *wax* a troublesome article to use. He says, "Too much care cannot be taken to get every particle of wax out of the flasks before putting the rubber into them." Unless this is done, "It gets into the rubber, makes it soft and brittle, so that it will not take a good polish, and will not bear the test of wear, etc." I object to all Dr. C. says about the deleterious effects of wax in the flask, because it is contrary to my experience. I will therefore briefly give my mode of manipulating rubber, and the results.

Impressions and models taken and made in the usual way. That part of the model which is to be covered by rubber is varnished with a solution of gun-cotton—two coats. This I use instead of tin foil, and it is much better, as it leaves the rubber clean without either the plaster or tin adhering. After the varnish is dry, which will be in two or three minutes, make a plate of thick tin foil (such as is used by druggists), bending it over the cast, and pressing it down with the fingers and burnisher, and trim to the size that you wish the rubber to cover. Over the tin place a layer of wax, a little thicker than you desire the rubber to be when finished. The wax I use for this purpose is rendered a little sticky by the addition of either turpentine or Canada balsam. While the wax is warm, press it down snugly to the cast over the tin foil, and trim off the surplus. When the wax is cool it can be taken off; the tin foil adheres to the wax, and is sufficiently firm to try in the patient's mouth while grinding up the teeth, should you desire to do so. When the teeth are arranged as you wish them to be, add to and trim the wax so that it will be as you wish the rubber plate to be after vulcanizing. Then set in the flask with plaster in the usual way. As soon as the plaster is well set, separate the parts and place on the stove till the wax melts, and if it boils and is all absorbed by the plaster, do not be alarmed, for your work is not injured. When the wax is melted, turn off what will flow out, and with pliers pick out the tin foil plate. A bit of cotton on the point of

* These tumors are not the polypi of the antrum.

an excavator, passed around the teeth and over the cast, will gather up the remaining wax and particles of dirt or plaster that may have gotten in. Pack and vulcanize in the usual way, *being sure that you have rubber enough in, and a good degree of pressure.* By this method, my experience has been that neither little nor large bits of wax have in any way interfered with the work; neither does it produce spongy or brittle rubber, or in any other way interfere with the process of vulcanizing. In order to test this matter more fully, I have just completed a set where I packed the rubber while the wax was frying around the teeth, and it came out just as good as any—good color, hard, but not brittle or spongy, and polished as readily and as well as any set I ever saw.

By this process it will be seen that the use of gutta-percha is entirely dispensed with. I find the tin foil and wax plate cheaper, more quickly manipulated, and answering every purpose that is gained by the use of gutta-percha. The reader may ask, "Why this difference in the experience of two dentists?" I cannot tell; but of one thing I am quite sure, spongy or brittle rubber does not result from particles of wax remaining on the model or around the teeth. I will also venture to suggest, that Dr. C., in process of time, will find that spongy and brittle rubber comes from some other cause than little particles of wax. Good materials, care in manipulating, plenty of rubber, strong pressure, not too much haste while vulcanizing, bring me uniform good results.

I use Hayes' flasks and vulcanizer with kerosene lamp, and like it better than any other, because it is easy to use, does not readily get out of repair, and produces as good results as the most fastidious can ask for. I set the teeth and cast in the plaster so as to pack from the lingual side. This method may require a trifle more time in some cases than the other mode; but with me it produces better uniform results, without danger of breaking the teeth or wearing the cast. In cases where the teeth set close to the cast, and it is impossible to pack under them, put in plenty of rubber, boil well, and then bring the parts together gradually, and the pressure will carry the rubber into every particle of space left open. By this method, if the two parts of the flask are not brought exactly together, you are sure that the teeth and plate will occupy the same relative position as they did when they went into the flask. The excess of rubber being on the lingual surface can be readily trimmed off.

I take exception to another part of Dr. C.'s article. In the first part he objects to open joints (who does not?), and then, as I understand him, virtually instructs us how to obtain open joints! He admonishes us to be careful that there shall be no wax over the joints, so that if there is any space the plaster will run in so as to prevent the rubber from entering. Now my plan is to grind the blocks, so that there shall be as little space as possible; but before setting the teeth in plaster, I am careful to see that there is no wax between the joints, and still more careful to cover the joints outside and inside with wax for the very purpose of keeping

out the plaster, should there happen to be any space between the blocks. I do this because I want the space filled with rubber and nothing else. Why leave these spaces open to form a cess-pool as long as the patient wears the teeth? Is it not better to have them filled with rubber, even if it show a trifle at the joints? I think it is, and practice accordingly; and so long as it is impossible to grind the blocks so that there shall not be a space between the joints, I deem rubber the very best article to have them filled with. The very fact that rubber work can be made so that there is no space under or between the teeth, is one of the very best arguments in favor of its use.

NEATNESS AND MANNERS.

BY A. F. DAVENPORT, NORTH ADAMS, MASS.

WHEN we consider that looks and actions combined, make the first impressions upon the stranger, and are often the most lasting, I trust my dental brethren will bear with me in a few plain suggestions.

One of the most common faults in the character of a dentist, is a want of neatness in his office. No operator upon the teeth can hope to please and retain his patients—especially the female portion of them—unless a strict regard is paid to the neatness of his office, his instruments, and his person.

Great watchfulness and care are constantly required, where many are coming and going, to keep everything in as neat and tasty a manner as possible.

His rooms, in every respect, should be furnished neatly, and with due regard to the comfort and entertainment of friends, who often accompany the patient, and remain while the operations are being performed.

Any ostentatious display of instruments, however beautiful, is in exceeding bad taste, and will often offend those whom we most desire to please. Great care should be paid to the proper cleansing of instruments, after an operation has been performed for one patient, before commencing upon another. In this way, the instruments will not only be kept clean, but free from rust; and if proper order is maintained, there will be no confusion, in the midst of an operation, to find the one most needed.

Neatness of person is also absolutely necessary, as well as cleanliness in his office, and in the different articles used in his practice. As the apparel often bespeaks the man, a due regard should be paid to dress, as the business of the dentist is such that he can always be dressed in a neat and respectable manner; a *want* of neatness in this particular denotes a want of that system, which every dentist must possess, if he expects to arrive at any degree of eminence in his profession.

Proper order in everything pertaining to himself and office will always

be appreciated by the better class of his customers; for those who employ him most—who pay the greatest attention to the preservation of their own teeth—are generally from the most elegant, refined, and highly cultivated class of society; it is therefore highly important that we exert ourselves to please this class of our patrons. But however neat and elegant the dentist's rooms and person may be,—however dignified in his deportment, and however exemplary in his life and character,—he must not expect to succeed in his profession at the present day, unless he is pleasing and accomplished in his manners. To none is an agreeable manner of more importance than to him whose duty it is to minister to the personal wants of his fellow-men—to the dentist especially are these qualities of the highest importance—indeed, it may almost be said that without them he will be sure to fail in his profession. The educated and gentlemanly man, in his profession, will draw around him patients of the same class. We may see this exemplified in the practice of almost every dentist; his patients, with perhaps few exceptions, resembling him in tastes, feelings, and manners. On the other hand, he who is inattentive to the little courtesies and civilities of life; who has not a modest self-composure, united to gentle and agreeable manners; who does not study to please in little things, but is blunt, impatient, and disagreeable in his office, with a careless and slovenly exterior, with unclean hands and nails, a distorted mouth, with blackened and decayed teeth;—in short, if he is addicted to that—the *filthiest* of all habits, the use of tobacco—he never need look for success in his profession. Nor is it alone in his office that the dentist should strive to please; but in all the social relations of his life his personal deportment should always be such as to command the highest respect and esteem from those with whom he comes in contact. He should always be content to let his works praise him, which they surely will do, if they are good: whatever real merit we have, other people will discover.

Patience is also an indispensable virtue to the dentist. There are many occasions in his practice when it will require great self-control to preserve his patience and equanimity of temper. This is particularly so when called upon to operate for children who have never been controlled at home, and with timid, hesitating persons, who have not sufficient firmness of nerve to submit to necessary operations. In these cases, the dentist will need all his eloquence and persuasions to encourage the timid and sustain the weak and faltering. He must be patient with the hesitating; gentle and persuasive with the young and timid; long-suffering with the irritable; cool and deliberate with the impatient; and at all times exhibit a kind, encouraging sympathy for the sufferings of his patients.

Kind words and pleasing manners, under such circumstances, will do much to gain their confidence and affection.

Finally, he should be a man in every particular worthy of imitation and example.

RESULTS OF DESTROYING PULPS, AND PLUGGING PULP CAVITIES.

BY HENRY S. CHASE, M.D., D.D.S., IOWA.

WHOLE number operated upon in eight months	30
For males	7
For females.....	23
Arsenic applied once in.....	25 cases.
“ “ twice in.....	3 “
“ “ four times in.....	2 “
“ caused pain in.....	10 “
Number of days before plugging.....	2 in one case.
“ “ “ “	3 “ “
“ “ “ “	4 “ “
“ “ “ “	7 in eleven cases.
“ “ “ “	50 in two cases.
“ “ “ “	30 in one case.

The other cases ranged from 9 to 18 days each.

Periostitis followed plugging in..... 2 cases.

Suppuration “ “ 1 case.

Extracted, none.

Number of months since operation to this date, average $4\frac{1}{2}$.

CLASS OF TEETH.

Right upper first molar, 1; right upper second bicuspid, 4; right upper first bicuspid, 1.

Left upper first molar, 3; left upper second bicuspid, 4.

Right upper central incisor, 4; right upper lat. incisor, 2.

Left upper central incisor, 4; left upper lat. incisor, 1.

Right under second molar, 2; right under first molar, 2; right under second bicuspid, 1.

Left under second molar, 1; left under first molar, 1; left under second bicuspid, 2.

Left under first bicuspid, 1.

PERIOSTITIS AND SUPPURATION.

Case No. 1. Woman, aged 30, periostitis.

“ “ 2. “ “ 30, “ right upper second bicuspid.

“ “ 3. “ “ 15, suppuration; right under first molar.

Case No. 1. Pulp removed..... 7 days before plugging.

“ “ 2. “ “ 3 “ “

“ “ 3. “ “ 4 “ “

No. 1. Months before periostitis..... 1

“ 2. “ “ “ 2

“ 3. “ “ suppuration..... 1

Nos. 1 and 2 were in the same mouth.

Ages of those operated upon—15, 15, 18, 18, 18, 19, 20, 20, 20, 21, 21, 22, 23, 25, 25, 28, 28, 28, 28, 30, 30, 30, 30, 32, 32, 40, 45, 60.

There were some temporary teeth operated upon which are not included in the above. None of which have been diseased, since being plugged, as far as I know.

No cases are here reported that have not been plugged two months to this date.

My experience is that teeth are more liable to periostitis within the first month than after. It will be observed that the second bicuspid of the upper jaw form nearly one-third of the cases. Next in frequency the upper central incisors. By summing up the results of many reports like this a very reliable table could be formed of the relative frequency of decay occurring in the various classes of teeth.

This report will be more satisfactory with a summary of the mode of treatment. Arsenic, tannin, and creosote as a devitalizer. It remains twenty-four hours. It is then removed, and at that time the pulp also. If the latter is not dead, I wait a day or two before applying the arsenic again. When pulp is removed, syringe thoroughly with warm water, and fill pulp cavity with a *saturated* tincture of sulphate of tannin. Plug with cotton and sandarac for one week. It will be seen by report that patients delay coming for some time after. In ten cases of the thirty they ran from seven to eighteen days. At the end of a week I remove the cotton, syringe with warm water, and place a pledget of cotton and creosote in the cavity of the roots. I think I rarely, if ever, remove *all* the vessels in the roots, excepting the incisor, canines, and palatine roots of upper molars.

If the vessels of the roots are alive when I remove the pulp, and are beyond my reach, I plug the tooth at the usual time, regardless of their vitality. Not included in the above report are six cases of plugging pulp cavities where the pulps were already dead. None became diseased after. Not included in the above also, are all teeth treated for alveolar abscess and afterward plugged. The latter cases will be embodied in a separate report.

NEW METHOD OF RIMMING GOLD PLATES.

BY J. M. GRAY, FRANKFORT, KY.

It affords me much pleasure to contribute, through the pages of the DENTAL COSMOS, a discovery which I have made in rimming gold plates, which, I think, is far superior to the old method of using a strip for that purpose. My method is as follows: I finish a gold plate as usual with gum teeth, leaving the edge of the plate to extend say an eighth of an inch above the gum, the gum to be ground off square, for reasons herein-

after mentioned. After the teeth are thus ground, fitted, and soldered on to the plate, I take a sufficient quantity of gold foil and amalgamate it with mercury, making a paste similar in appearance to Hunter's amalgam, when prepared for filling a tooth, being careful to remove as much of the mercury as possible by pressure through buckskin. With this amalgam, I carefully fill up the angle between the end of the gum and the edge of the plate. I then incase the whole in plaster and sand, covering the amalgam very slightly, after which it is subjected to a cherry-red heat, in order to drive off the mercury; the plaster being then removed, the gold will be found resembling Watts' crystal gold, and firmly united to the plate, so that nothing remains to be done but to condense and burnish the gold thus deposited, which makes a firm rim, and adds very much to the beauty of the plate. The gum ends being ground off square, you will observe, gives to each tooth a firm foundation upon which to rest, thereby making them much stronger than when dependent upon the rivets alone for their support. If the rim is not full enough, the process may be repeated until the desired object is obtained. I omitted to mention in place that the surface to which the amalgam is to be united must be thoroughly cleansed with dilute sulphuric acid.

This is not a mere experiment with me, as I have tested it to my entire satisfaction: and my success with it warrants me in recommending it to those who may desire to avail themselves of the use of it. I offer it to the profession as a slight return for the many valuable lessons which I have had imparted to me, through the *News Letter* of the past years and the *DENTAL COSMOS* of the present date, hoping that my fellow-practitioners may find, as I have done, great satisfaction in its use.

I will take pleasure in describing more minutely any point in the operation to gentlemen who may desire the information, if they will drop me a line upon the subject.

CREOSOTE AND ARSENIOUS ACID.

BY WM. H. WAITE, D.D.S., LIVERPOOL, ENGLAND.

AT the November meeting of the Odontological Society of Great Britain, a paper was read by the President, Thos. A. Rogers, M.R.C.S., on "Fang Filling," which very much interested me, and especially the portion of it that related to the devitalization of the pulp. My attention was, however, arrested by a statement made under the heading, "The Best Form of Arsenical Preparation," viz., "The creosote both diminishes the pain, and, *by dissolving the arsenic*, brings it into more immediate and speedy contact with the substance of the pulp." Referring to the excellent work on "Operative Dentistry," by Dr. Taft, I find a statement to the same effect. Speaking of arsenious acid, he says, "It is very soluble in creosote and all the oils of that nature."

It has been my custom to receive all such statements cautiously, and, whenever practicable, to ascertain for myself their accuracy; and having met with statements directly contradictory of the above, I determined some six months ago to test the matter.

No. 1. To half a grain of arsenious acid, one drachm of pure creosote (so called) was added. The bottle was well shaken, and, being placed in a convenient situation, I have been in the habit of shaking it several times a week for nearly six months. The perusal of the President's paper led me at once to consummate the process by taking a portion—say fifteen to twenty minims—of the clear creosote (the arsenious acid being settled at the bottom of the bottle), and adding to it a little hydrochloric acid. A slip of copper foil was boiled in the solution. A slight film of organic matter was deposited on the foil, but, on reheating in a dry tube, no trace of arsenious acid was discoverable. This experiment alone convinced me that, in those proportions at any rate, creosote has not the power of dissolving arsenious acid.

No. 2. Half a grain of arsenious acid to one drachm of creosote, the whole being rubbed together in a mortar for one hour. Two drachms of creosote were added, and, transferring all to a bottle, they were well shaken together repeatedly during one week. A few hours' rest was sufficient for the arsenious acid apparently to settle at the bottom, leaving the creosote clear.

No. 3. Half a grain of arsenious acid was rubbed down with one drachm of pure carbolic acid (the mortar standing in warm water) for one hour. Two drachms of pure carbolic acid were added, the whole well shaken in a bottle, put in a warm place, and frequently agitated during one week.

At this point I referred the matter to my friend, Dr. Edwards, an analytical chemist of great repute here, who very kindly volunteered to test any preparations I might submit.

Nos. 1, 2, and 3 were at once handed to him, and, in my presence, subjected to Marsh's beautiful and delicate test, by which, as I am informed, one-thousandth part of a grain of arsenious acid is discoverable. About fifteen minims of each preparation were tested separately, and I have Dr. Edwards' authority for stating that not a particle of arsenic was traceable. Now, if in these proportions arsenious acid is *insoluble* in creosote, there can, I think, be little doubt of its *insolubility* in the proportions contained in the formula of arsenical paste given by the President. Creosote is valuable as an ingredient of arsenical paste for two reasons—first, on account of its remarkable power of obtunding sensibility; secondly, because it forms a convenient medium of combination, very suitable in this connection. Beyond these, I am unable to admit (from my present acquaintance with the subject) the agency of creosote in arsenical preparations for the devitalization of the dental pulp.

ORTHODONTIA.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF INSTITUTES OF DENTISTRY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 66.)

Fourth.—Improper dental manipulations.

The fourth cause of dental irregularity to which I shall direct attention, is one which requires especial care in its presentation, as it involves all that portion of dental education which is embraced in a minute knowledge of the embryology and development of both deciduous and permanent teeth. Without any information in this direction, some practitioners are reasonably successful in the correction of bad cases of orthodontia, but no such persons are in the least degree fitted to watch over and direct the changing denture of early life; their opinions as to the advisability or non-advisability of dental interference would be worth just *nothing*, and their proceedings, in this connection, would be unworthy the appellation of "dentistry." Under the title of "premature extraction of deciduous teeth," a vast amount of positive injury to patients is condemned, but it should be as well understood that we may err upon the side of non-extraction just as detrimentally as upon the side of extraction.

It is true that much less injury would result from persistent non-extraction than from persistent extraction, but it is not *thus* that proper lines of practice are drawn; it is only by intimate acquaintance with every successive change occurring in the growing and erupting teeth, as well beneath the gums and within the osseous structures as with those presented to the view, that opinions can be formed upon which to base a practice reliably advantageous: and it is here, therefore, that the practical study of orthodontia commences; in this way only that the dentist can fit himself for the proper prosecution of this branch of his specialty.

I have said that less injury would occur from persistent non-extraction than from persistent extraction. The reason for this is simple, because, in the vast majority of cases, a natural denture is the result of nature's efforts, while in a small minority of instances, a malpresentation of permanent teeth will be favored or induced by the persistent continuance of the deciduous organs; but it at once becomes important that we should know "normality and abnormality" to be by no means synonymous with "regularity and irregularity;" for it is just at this point that ignorance is not bliss, and that it is folly not to be wise! In place, therefore, we propose studying that series of dento-anatomical preparations which demonstrate the stages of dentition, in view of their bearing upon the treatment of dental irregularity. Under this fourth cause, I would, however, join most decidedly in condemnation of the extraction of deciduous teeth for the purpose of "making room," as it is called, emphatically declaring that it

most surely "makes trouble," and stating it as my opinion that the practice is founded upon false premises, and is almost universally productive of bad results, which, occurring at so remote a time from the performance of the operations, are apt to be regarded as having no direct connection, as *effects* from *causes*, which they unquestionably have. This I shall also endeavor to explain in considering this division of our classification.

Fifth.—Accidents.—I have thought it advisable to incorporate this as one cause of irregularity more for the sake of completeness than from its strict claims for recognition in connection with orthodontia; for, while I admit the liability of irregular denture as a sequence of many accidents, I am compelled to view the treatment of these as pertaining more properly to that oral surgery which embraces fractures, tumors, and lesions generally.

Sixth.—It has been suggested that *want of muscular tonicity* should be regarded as a cause which results in dental deformity; and viewing this theory favorably, I therefore present it as worthy of consideration.

Seventh.—Loss of permanent teeth.

(To be continued.)

PIVOTING TEETH.

BY CHAS. BARNES, D.D.S., SYRACUSE, N. Y.

A paper read before the Central New York Dental Association.

I HAVE selected, in addressing you, the subject of pivoting teeth, and, although it is a branch of the profession much practiced, some of the details do not appear to me to receive that attention which their importance demands. I am not unmindful that many of the gentlemen I have the pleasure of addressing have had much more experience in this branch of our profession than myself; but I trust the time will not be considered lost in listening to the few suggestions I have to offer.

Pivoting is, I think, advisable when the crowns of the centrals, laterals, cuspidati, and bicuspid teeth are so decayed as to be useless, and the molars in good condition. Should the pulp of the tooth be still alive, I should devitalize it in the usual manner by making an arsenical application. After this is accomplished, the first step is to cut off the remaining crown, which can be done either with the file or excising forceps. If the remains of the crown be of a substantial character, it is well to first use the file or saw, commencing at each approximal surface, filing toward the centre and finishing with the excising forceps. The object of first using the file or saw is to avoid splitting the root or causing too great concussion, which there would be danger of inducing if the operation be performed by the excising forceps only. The root should then be filed down, so that the new crown will unite with it just under the free edge of the gums. An

oval or half-round file should be used for this purpose. After removing the remaining crown and filling the root as above, prepare the pulp cavity and drill to the proper size for pivoting. This being done and all foreign matter removed, dress the cavity with cotton moistened in creosote, and place over this a cotton-sandarac filling, leaving the completion of the operation for a future appointment. The objection to finishing the operation at the first sitting is the danger of inducing inflammation in the peridental membrane, which not unfrequently arises, even in favorable cases. Where the root is much decayed and irritation exists, thoroughness in the removal of all the soft matter is of great importance. This being accomplished, it is well to make a dressing of creosote and tannin, changing it every day until all soreness ceases.

The root above the pivot should be filled to the extremity with gold. This is often neglected; while, in fact, this is one of the most important parts of the operation to insure success, as it prevents the accumulation of foreign matter, the presence of which would prove a source of irritation and subsequent inflammation, and perhaps render all previous work useless. Having prepared the root thus far, fit a temporary pivot, take an impression in wax, and at the same time get the color of the adjoining teeth. If the operation is for a resident of the same place, another appointment in one, two, or three hours can be made, as best suited to the convenience of the operator and patient. The object of this is to enable the operator to fit more perfectly the new crown, and, at the same time, saving much annoyance to the patient. In fitting the new crown, great care should be used to have it fit firmly on every part of the root.

There are several methods of securing a pivot tooth, although I believe the general practice is to use pivots made of hickory. If wood is used alone, well-seasoned hickory is the best, as it possesses greater strength and elasticity. A pivot made with wood should be filed to near the size of the orifice of the root, and condensed by forcing through a gauge-plate until reduced to the desired size. The pivot should, then be forced gently with the thumb and finger of the operator into the canal until the new crown is in its proper position, which is certainly of great importance. I believe the best method is the one recommended by Dr. Harris, consisting of gold incased in a cylinder of wood. It is made in the following manner: A piece of gold wire is passed through a screw-plate. A hole is then drilled lengthwise into a piece of well-seasoned hickory as far as is required for the length of pivot. Into this the wire is screwed, and then cut off close to the wood, which is reduced with the file or knife to the size of the orifice in the artificial crown, and firmly forced into it. The projecting part of the wood to the termination of the wire is trimmed down to the size of the cavity in the root and cut off, when the tooth is ready for insertion.

TISSUE PAPER AS A PROTECTION TO THE MODEL.

BY H. H. STEPHENS, D.D.S., PELLA, IOWA.

I HAVE gleaned much valuable information from the contributions to the pages of the DENTAL COSMOS; therefore feel desirous of contributing my mite, by assisting the operator in the manipulations for the vulcanite base.

After the model is taken from the impression, and saturated with water, I cover it with colored tissue paper, being careful to adjust it to all the inequalities of the parts.

It will protect the model from scratches which might otherwise be made upon its surface, and where it is necessary to set the teeth on the gums, the wax or gutta-percha base plate can be melted off by the application of a heated wax knife, without any fears of its being absorbed by the model, as the tissue paper will effectually prevent any wax from coming in contact with the plaster. Now this may be practiced by others of the profession, but I have not seen any statement to that effect; and if it assist any worthy brother of the profession, I shall consider myself amply rewarded.

PREVENTION OF DENTAL CARIES.

BY C. E. LATIMER, D.D.S., NEW YORK.

A paper read before the Society of Dental Surgeons of the City of New York.

Mr. President and Gentlemen:—It is not my purpose to write at length upon the subject of the evening, but merely to dwell upon one or two points. With respect to the *cause* of dental caries, I presume all will subscribe to the chemico-vital theory so generally taught now by the leading minds in our profession; but in regard to the *treatment*, a book might be written without exhausting the subject, for it includes nearly all that used to be classed under the head of operative dentistry. Decidedly the best method of treating caries is to prevent it, as an Irishman would say, and even an Irishman could not come nearer the truth. The old saw that “an ounce of prevention is worth a pound of cure,” applies to no subject with more force than to the one now under consideration; and I verily believe that long before the millennium shall arrive, the duties of dentists will be chiefly confined to the *prevention* of that which they now so often but temporarily check.

It always makes me feel badly when I hear dentists speak so confidently of permanently saving teeth by removing the caries and substituting gold. Nearly every day I am obliged to counteract the tendency of such teaching, which patients get from advertisements in the daily papers, and from dentists who, I would charitably believe, *ignorantly* announce that a tooth once properly filled is thereafter safe. Such assertions lull the

patient into a fancied security, from which he is soon unpleasantly aroused by a sharp twang of pain in a tooth that was filled and warranted for life. As a natural result, he loses confidence in dentists and dentistry, and "don't believe it does a bit of good to fill teeth." I endeavor to impress upon the mind of every patient for whom I work the fact that my best efforts alone will not permanently save their teeth, but that the matter rests with themselves. After I have used my best efforts to restore, as far as possible, the original health of a tooth, I tell them that my part of the work is done and now theirs is to begin. They can destroy the tooth in one year, ten years, or twenty years, as they please, and perhaps the quickest, certainly the easiest and most usual method, is by simply letting it alone. If they can prevent acids from coming in contact with the tooth it will never decay, but, as this is morally impossible, it will be *liable* to decay in spite of every effort, and should be carefully examined by a dentist occasionally to see if it is all right. We, as dentists, should work as though all the responsibility rested upon us, but teach our patients as though all was with them.

I am often asked how long I warrant my work, with the remark that Dr. So-and-so warrants his fillings for a year, or something like it; but I tell all such inquirers that I never warrant my work for one moment. A tooth which has been filled may, by the same influences which produced decay in the first place, be decayed a second time, and more speedily, for a lower degree of vitality prevents it from offering the same resistance to caries that it did at first, so that filling a tooth may be but a temporary arrestation of caries at that particular point, and if a patient wishes to preserve the teeth after filling, he must turn over a new leaf entirely, and commence a course of treatment which shall, so far as possible, neutralize all acids that may be generated by the decaying food between and around them. When a physician is treating a case of bronchitis, the patient does not ask how long he will warrant the cure, but the doctor says, take especial care to avoid the causes which brought on this disease, for, although I have done the best I can for you, yet you will be predisposed to inflammation of the bronchial tubes, and must use every precaution, or despite all my care, your life will pay the forfeit.

If patients think, as many are taught to, that the responsibility of the preservation of their teeth is all removed to the dentist, they will not attend to such precautions as are absolutely necessary to save them. For all practical purposes caries of the teeth may be said to be caused by the chemical union of an acid with the alkali, which is the lime of the tooth. The acids of fruits, the eructations of an acid stomach, the different mineral acids used as tonics, the secretions of an inflamed mucous membrane, and the acid of the saliva (when from any of the different causes it becomes such), each and all are fruitful causes of caries; but, more to be dreaded than all of these combined, is the acid formed by the decaying

food left between the teeth. Most of people will become highly indignant if told that they do not know how to brush their teeth; but it is really surprising to observe how little attention is paid to this matter. Parents give their children a stiff tooth-brush, not fit to be used in any mouth, and tell them to brush their teeth, without a word of direction as to how it should be done, and they, the dear innocents, finding that the stiff bristles scratch their tender gums, brush gingerly over the ends of the teeth for a moment, then run off to get the stick of candy which pays them for this laborious effort. If the teeth should decay, after all this outlay of time and candy, it must be of course an afflicting dispensation of Divine Providence. I will venture the assertion that *no* one, with the best kind of a tooth-brush, used in the best possible manner, can keep the teeth clean.

I will also say that, in my judgment, the majority of people would preserve their teeth and gums in a healthier condition if they would throw their brushes to the dogs, and rub the teeth and gums with a bit of muslin or even the finger instead.

Mark, I have not a word to say against the right kind of brushes properly used, but only against the ordinary stiff brushes as they are usually employed, which serve but to collect the food between the teeth, where it soon ferments, eliminating an acid, and destroying the teeth. A stiff brush will naturally be kept away from the margins of the gums, where the most cleaning is needed, because it gives pain and brings blood, but, in spite of all care, the stiff bristles will spread off, and, working back and forth under the free edges of the gums, keep them separated from the necks of the teeth, thereby forming a receptacle for the lodgment of food, and, by the inflammation thus induced, cause an exudate of acid mucus, serving to produce caries. Where an astringent wash or powder is employed, the evil effects are not so marked, but the majority of people use nothing of the kind. Again, if a person is in vigorous health, with the secretions of the mouth in a normal condition, a hard brush would be less objectionable; but the majority of people are not thus blest.

I hold that for most patients a moderately soft brush is best, which can be used vigorously over teeth and gums, and which may be rolled so as to pass the bristles in between the teeth, thereby throwing out the food. Floss silk or a rubber string passed between the teeth will remove a portion of the food left by the brush. In connection with the tooth-brush a good article of tooth-powder should be used, containing, among other things, an alkali, such as Castile soap or chalk.

If restricted to the use of one article I should prefer the common prepared chalk, and I most heartily wish that every one, and especially those belonging to the poorer classes, could be induced to invest ten cents a year in this article for a dentifrice. What a happy change would be

brought about in one short year if this could be used thoroughly! I place particular stress upon cleaning the teeth before retiring for the night, believing that caries progresses much more rapidly during the night than during the daytime. It is truly a glorious thing to treat a badly diseased tooth, restore the parts to comparative health, and build up an artificial crown of shining gold, that shall be "a thing of beauty and a joy" as long as it lasts, and I feel like taking off my hat when I meet a man that can do it. But, my friends, it is a thousandfold more glorious to prevent this disease. I am aware that it is not as remunerative, and here lies the great difficulty in the way of the plan I advocate, and it will remain so until the people are more enlightened. I call upon the members of our noble profession present to bear a hand in this good work, by urging upon their patients the necessity of *preventing* instead of relying upon *curing* caries. I am not sure but the Japanese method would be a wise one. They pay the family physician a specified sum every year until some member becomes sick, when the salary ceases, and does not commence again until health is restored in the household.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

A MEETING of the Society was held on Monday evening, February 5th, 1866, in the Philadelphia Dental College building.

The President, Dr. Jas. M. Harris, in the Chair.

Dr. McQuillen, the Corresponding Secretary, exhibited a BLOW-PIPE invented by Dr. Geo. B. Snow, also an AUTOMATIC PLUGGER, invented by Drs. Geo. B. Snow and Theo. S. Lewis. With regard to the latter, he remarked that it had only been in his hand a few days, and having had no experience in its use, he could not venture to offer any other opinion with respect to it than that if it should prove to be as *useful* in practice as *ingenious* in construction, it would be a valuable adjunct to the dental instruments now employed.

The discussion for the evening was then taken up—subject:

"THE ADVANTAGES AND DISADVANTAGES OF TREATING AND FILLING EXPOSED PULP CASES."

Dr. Kingsbury.—It appeared to him that there was at present only one side to this subject. The advantages to be secured by the proper treatment of teeth with exposed pulps and filling their roots, were so great and uniform that there can be only one opinion among intelligent

and experienced operators of the present day. He was not ignorant of the fact that there was a period, not very remote, in the history of our profession when the extirpation of the dental pulp was a novelty, and the preservation of that class of teeth was considered of doubtful utility. The extirpation of the pulp by the use of a small broach, before anæsthetic agents came into vogue, was attended with so much pain as to make it decidedly objectionable on the part of the patient. The discovery of that valuable escharotic, arsenious acid, in its application to exposed pulps, was a new epoch in the history of dental practice. Since this new, safe, and efficient auxiliary had come to our aid, the most timid and nervous patients were easily managed, and the most difficult cases made amenable to treatment. He had felt for a long time that a special debt of gratitude was due to the man who discovered and made known to the profession this wonderful pain obtunder and nerve destroyer. To Dr. John R. Spooner, of Montreal, and his brother, Dr. S. Spooner, of New York, belong the honor of first testing and then making known to our profession the value of arsenious acid for the purpose of destroying exposed pulps.

It has been supposed that Dr. Hudson the elder, of this city, was one of the first to fill the roots of teeth with gold. Dr. Maynard informed him that he had seen a superior central incisor in the mouth of Major Barker, an officer of the Treasury Department at Washington, thirty-five years after it had been filled by Dr. Hudson. It was beautifully done, and in a good state of preservation. This operation must have been performed not less than sixty years ago. Such fillings were exceedingly rare then, as were also such dentists as the operator in this case. Drs. Harwood and Bemis, of Boston, Dr. Cherry, of Baltimore, and Dr. Maynard, of Washington, rank among the noble pioneers in this wide field. Time would not permit him to enter into any minute details touching his own practice. He had treated a very large number of teeth of this class during a period of twenty years. He could bear the strongest testimony to the inestimable advantages bestowed upon his patients by his own treatment of such cases, and he could also state that it afforded him pleasure to be able to add the testimony of his own *personal experience* to the value of such operations upon some of his own teeth filled years ago, ever since doing good service, and in a fine state of preservation at the present time.

Dr. McQuillen said that with respect to the advantages and disadvantages of treating exposed pulps, in his opinion it was all on the side of advantage to the patient when the operation was properly performed. His own experience in this direction had been an extended and successful one, while, not having the audacity to claim that he never had any failures, yet the proportion of these was so small that it did not exceed one case in a hundred. The detail of treatment he did not think it necessary at that

time to enter upon, as it was generally known to the members, and did not differ materially from other gentlemen. In filling the pulp cavity he preferred gold foil to any other substance, and, although there might be cases in which cotton or Hill's stopping would be indicated, as a temporary filling, yet, as a permanent investment, he preferred gold to either. When introducing such a filling he did not put it in with the expectation of taking it out, but of leaving it there as long as the tooth lasted. The objection urged against the use of gold as a conductor of thermal changes, proving a source of irritation to the peridental membrane, he was disposed to regard as fallacious, on account of the fact that the dentine and cementum of the root as non-conductors would prevent such impressions being received by the membrane.

Dr. Flagg said that he supposed it was well known to those present that he had no fear of the "terrible consequences" of allowing arsenical applications to remain in teeth for days or even weeks, as years of experimentation had proved to him the folly, and, he would even say, *fallacy* of the textual authority in this direction. He wished to be distinctly understood, not as advocating the *necessity* of long-continued arsenical applications, but as positively denying the statements of one and all the books as to the evil consequences ensuing therefrom. He had taught and demonstrated (as many present could testify) the most *rapid* and *painless* devitalization of pulps: enough so as to satisfy the most *ignorantly timid*; but he wished not only to teach the truth, as eliminated by practice, in this direction, and in this denying the periosteal irritation as the result of the penetration of arsenic through the pulp tissue. He would not deny that arsenic produced much harm, if allowed to exude from the cavity of decay; on the contrary, he would warn earnestly against this. His practice was to devitalize a pulp and extirpate painlessly *in an hour*, if need be, or to allow his arsenical applications to remain, properly secured, for weeks, if his other engagements or the time of the patient would not sooner permit an appointment for the extirpation of the pulp. He thought the lower bicuspid the most unsatisfactory teeth to treat. Regarded gold as meeting the most perfectly the greatest number of indications in connection with filling teeth. Considered tin foil the next best material, *except* as fillings for pulp cavities (not canals) under amalgam; here either gold or gutta-percha should be used: tin became softened, blackened, and disintegrated by contact with mercury. Uses cotton saturated with oil of creosote and oil of cloves for filling the canals of roots. Regards it as much more difficult to fill a canal *well* with cotton than with gold, but infinitely easier to remove in case of after-trouble from imperfect extirpation; has seen no more numerous cases of trouble after cotton-root fillings than he has after gold-root fillings. Gentlemen have spoken of three cases in a hundred of gold-root fillings which have eventuated in extraction—such a per

cent. as that would effectually deter him from abandoning his present practice. He had, under sundry influences, twice returned, during the past ten years, to gold-root filling, and he would say that he had each time experienced a peculiar feeling of "*thoroughness*" in connection with so doing, but a year or eighteen months subsequent trial had always brought him back stronger than ever to his faith in cotton. He wished to state that the gold root-fillings of others had done quite as much to convince him of their objectionable features as those of his own introduction. He felt peculiar satisfaction in removing these thoroughly consolidated root fillings from valuable teeth in the mouths of his *dental brethren*, where intense periosteal irritation had supervened. They were apt to be strongly impressed with the sensations which usually were felt at the *patient's end of the instrument*. He thought this canal filling was no novelty; the fathers and grandfathers of present practitioners filled as is usually advocated now, but he trusted, for the comfort of the community and the salvation of teeth, that the sons and grandsons would have better methods, and the first step in that direction, he thought, was to substitute root fillings, which, *if occasion required*, could be removed without the infliction of so much torture as to decide the patient in favor of the removal of the tooth. There seemed to him but one side to the question; he treated everything that presented, giving trouble, which required relief. His practice, almost universally, was to remove the *cause*, and *let alone*: no dressings of creosote and iodine and tannin and chloride of zinc, etc. to the end of the pharmacopœia, but to so arrange things as to give that form of force which we call "life" a chance to become developed, and thus to put things in a condition very nearly allied to what they were before normal nutrition was interfered with.

(To be continued.)

REPORT OF DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S., NEW YORK.

Dec. 20th, 1865.

SUBJECT for discussion: "CAUSE AND TREATMENT OF CARIES."

Dr. J. S. Latimer read a volunteer paper, of which the following is an abridgment:

We should try to get satisfactory reasons for all the phenomena we notice in the practice of our profession. "Try all and hold fast that which is good." Trying may mean a close study of the theory in connection with known facts, or it may signify experimental investigation, or both.

That teeth in the mouth are decomposed by acids is a generally admitted fact; so too of the predisposing causes—lowered vitality and defective composition and structure. These are not mooted points, but upon the *source* of these acids we differ: some asserting that they are mainly of gastric origin, others claiming them as abnormal secretions of the salivary glands and mucous follicles, while still others assume them to be the products of fermentation going on in various interstices and approximating surfaces of the teeth.

The likelihood is that all these theories are correct and yet *incorrect*, for each claims a monopoly. I have seen cases corroborative of this view. But it is probable that more teeth are destroyed by acid resulting from fermentation, by several hundred per cent., than from all other causes.

Some claim that the alkaline salts—the carbonates and bicarbonates of potassa and soda—are also destructive to the teeth. A member of the American Dental Convention, sitting at Boston, a few years ago, advocated this theory quite strenuously, and cited many cases to prove his hypothesis.

A Dr. Gleason, to whose lectures on physiology and hygiene I lately had the pleasure of listening, who had fallen in with a Down-East saleratus dentist, perhaps the same gentleman mentioned above, expatiated upon the immense amount of these dreadful alkalies used for culinary purposes by Americans, and ascribed to them the host of dental ills from which we suffer.

Said he, "If you place a sound tooth in a saturated solution of bicarbonate of soda, in forty-eight hours you may scratch the enamel off with your finger-nails."

It would have been easy to say pshaw! what nonsense! But that method is neither satisfactory nor profitable, so I placed a tooth in a bottle of the solution, marked it "Dec. 1st." This is the tooth which I present for your examination. I do not see that it has changed in the least, nor do I believe it would though immersed half a century instead of nineteen days.

You will recall that some time last summer two of our most notable members reported that they had seen cases, or had heard reports from patients, tending to show that a patent nostrum called "Sozodont" is injurious to the teeth. I expressed doubts, with reference to the soundness of the conclusions, at that time, believing it to be only a flavored saponaceous tincture, incapable of chemical action upon enamel.

I procured some of the substance in question, as well as some of a kindred compound called "Balm of a Thousand Flowers."

Here are some teeth which have been immersed in the undiluted tinctures during one hundred and fifty-five days. They are not in the least injured by the test, as you will notice. On subjecting both substances to the usual tests, they gave marked alkaline reactions.

That these substances are any better for preventing caries of the teeth than any clean soap, costing much less than they, I do not believe; but that they are quite harmless (except to the pocket), my experiments would seem to indicate.

And now I call your attention to a fourth experiment. Here are the *debris* of two molars submitted to the action of a very concentrated solution of caustic potassa, during three hundred and thirteen days. You will notice that the caustic alkali has broken down enamel, dentine, and cementum alike.

At first it may seem that we have an antagonism in my results and conclusions, but a moment's reflection will set that all right. In the caustic potassa we have a base hungering and thirsting after acid, while the *salts* of that same base have drunk to satiety. So of soda and its salts.

Now, it happens that potassa and soda in a concentrated form are never brought in contact with the teeth, nor are they subject to the action of saturated solutions of the salts of these bases. Hence the want of foundation for the alkaline theory of dental caries.

Dr. C. E. Latimer then read a paper on the PREVENTION OF DENTAL CARIES.*

Dr. Fitch then read a paper by G. A. Mills, the essayist of the evening.†

Dr. Castle liked Dr. C. E. Latimer's paper, it is honest, just, and practical, free from *ad captandum* nonsense and exaggeration. No practical dentist listening to Dr. Latimer's paper could fail to indorse it. There cannot exist the shadow of a doubt with reference to the important part the gastric acids perform in the destruction of the teeth. Chief among these acids are the oxalic, chloric, lactic, and phosphoric. These acids may be brought in contact with the teeth directly by eructation, or the mucous membrane may convey to the mouth the acid of the stomach by its own continuity. But the All-Wise has provided a safeguard for the teeth in that he has supplied the mouth with alkaline saliva. The result of the union of the acids named with the alkali of the saliva we see deposited upon the teeth in the form of salivary calculus; a large share of the salts, however, is swallowed with the saliva. These are the oxalate, chlorate, lactate, and phosphate of lime. We never find caries progressing beneath deposits of tartar, so that, however destructive the deposit may be to the gum and alveolar processes, it preserves the teeth from caries.

So long as the stomach remains in a normal condition, the teeth will be free from caries. To thoroughly understand the cause of caries we must study the pathological conditions of the various races, constitutions, temperaments, diatheses, etc., influenced by climate, diet, and modes of

* See page 471.

† Will be published in next number.

living. From the savage state up to the highest grade of civilization we notice a regular deterioration of the teeth.

Though the people of Ireland, the north of England, and along the Scandinavian belt of Northern Europe have well-organized dental organs and vigorous constitutions, yet, when they emigrate to this country, their children but add to the opprobrium of Americans as having the worst teeth of the whole human family. The cause lies in our artificial mode of living, inducing dyspepsia and a multitude of ills to which their fathers were strangers.

The "white decay" we so frequently meet with is due to the action of the gastric acids. Many persons have good teeth when quite advanced in life, but, from some gastric derangement, caries sets in and the teeth are lost—no treatment will save them.

The hygienic treatment indicated is the neutralization of the acid diathesis, strengthening the digestive organs, and carefully attending to the cleanliness of the teeth. Instead of the lotion of bicarbonate of soda recommended by Dr. Atkinson, he preferred and recommends lime-water. With reference to the general treatment, dentists labor under great disadvantages. Patients hear their recommendations and then—forget them.

Dr. G. F. J. Colburn had been much about the world, and hence had been able to observe the teeth of different peoples.

The Sandwich Islanders, among whom he had dwelt, subsisted mainly upon a vegetable somewhat resembling our beet. This was prepared and laid aside to ferment, when it had an agreeable, acid taste. Notwithstanding this fermented food, they had no dental caries and no tartar. One of two sisters married an European, and changed her mode of life to suit her new relation. For this lady he had occasion to fill several teeth, but the other sister had no such trouble. The jaws of these islanders were all well developed and the teeth very regular. They consumed considerable quantities of raw fish, upon which they ate common salt, as they did also on other articles of diet.

Mr. J. W. Lyon, while practicing dentistry in California, and when traveling along the Pacific slope for hundreds of miles, as he had, was blest with abundant opportunity for observing the Digger and other Indians. They had invariably broad faces, and jaws of horseshoe shape. The teeth were perfectly sound, even in very old people, among whom he rarely saw a gray head, and never a bald one, except the scalping-knife had preceded his observation. Their food is worms, crickets, grasshoppers, pine-nuts, a very little meat, and no salt. They eat no spices or seasoning of any kind.

Dr. Atkinson said, if we had perfect health of body in general, there would be no trouble about the teeth. The *cause* of caries of the teeth is the first question before us for consideration to-night. This subject takes such a wide range, that it is a hopeless effort to attempt to treat it even

in a terse and aphoristic manner in the short space of time allowed us in this place. In fact, to treat it even textually, demands of us a knowledge of creation, growth, and development of organic bodies, possessed by so few, that it would be regarded as presumption in me to criticise the great pioneers who have labored so long to bring forth, shall I say disappointment? to those who had hoped for full pronouncement of just what constitutes healthy and diseased actions.

The learned gentleman who preceded, asserted that "chloric" and "oxalic acids" were found in the stomach; from these assertions, please allow us to utterly dissent. If such statements can fall from the lips of well-read men, what is to become of the rest of us? As he too truly says, patients are too regardless of the injunctions laid upon them by medical and dental advisers. Our duty, most truly, is not all done when we have finished filling a tooth! It becomes us to teach hygiene by changing the habits of every patient for whom treatment of caries is demanded. Nevertheless, let it be remembered that cavities, once properly prepared and filled, are never again subject to extension of caries within the same surfaces. Therefore a tooth is saved for all time, so far as that place is concerned. Every year extends the catalogue of salvable teeth! We save many teeth now that would formerly have been unhesitatingly doomed to extraction.

The kind of teeth that present small black spots of caries we all like to treat, because experience has taught us that they are easily *saved*. But white, chalky cavities of decay dismay us all, because of the universal want of success attendant upon efforts to save them by merely excavating and filling, without preparatory treatment. These same opprobria of dental practice are now yielding kindly and satisfactorily to preparatory treatment with calcareous washes and frequent dressings of creosote from day to day. Excavate as much as you may at the first sitting, dress with creosote, and dismiss your patient, advising a free use of precipitated chalk rubbed between the teeth at night and left there till morning; then rinse out well with warm "aqua calcis" (lime water). Repeat this till tenderness of dentine is so far overcome as to enable you to securely fill with gold, and even such teeth are permanently *saved*. Decay at the necks of teeth from recession of the gums, is best treated in this way. Stiff brushes are liable to cause the gums to recede. Use a medium stiffness of brush with soap and powder as the case may demand, and you are safe.

The best preventive of decay of the teeth (and disease in general) is to live naturally, never spit, but suck the juices of the mouth from the follicles and adjacent glands, and swallow all that finds its way into the oral cavity. And to complete the conditions conservative of perfect health, be careful to breathe through the nose always, never through the mouth.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE annual commencement of the Pennsylvania College of Dental Surgery was held at the Musical Fund Hall, Philadelphia, March 1st, 1866.

The valedictory was delivered by James Truman, D.D.S., Professor of Dental Physiology and Operative Dentistry.

The number of matriculants for the session was sixty-nine.

The degree of D.D.S. was conferred on the following gentlemen by Henry C. Carey, President of the Board of Trustees:

NAME.	RESIDENCE.	TITLE OF THESIS.
JOHN P. ADAMS,	New York,	Salivary Deposits.
GEORGE K. BAGBY,	Virginia,	Nitrous Oxide.
HENRY BERNHARD,	New York,	Causes of Caries.
THOMAS H. BRADFIELD,	New Jersey,	Inflammation.
FRANCIS A. BREWER,	Missouri,	Dentistry a Science.
SAMUEL C. BRITTON,	Maryland,	Predisposing Causes of Caries.
CHARLES BUFFETT,	Ohio,	Arsenic.
PERLEY M. CHRISTIE,	Pennsylvania,	Inflammation.
WILLIAM H. CRARY,	New York,	Rubber versus Metal.
EDWARD S. DAVENPORT,	"	Iodine.
FRANCISCUS DOMINGUEZ,	Cuba,	Inflammation.
EUGENE C. FLAMAND,	"	The Art of Filling Teeth.
HAMILTON FORREST,	Maryland,	Decay of the Teeth and Treatment.
ALBERT HAPE,	Georgia,	Dentistry a Science.
JOHN A. HAUSER,	Pennsylvania,	Treatment of Exposed Pulp.
MILTON KEIM,	Michigan,	Artificial Dentures.
WASHINGTON K. LINEAWEAVER,	Pennsylvania,	Inflammation.
FRANCISCO MIGNOTTE,	Cuba,	Extracting Teeth.
JAMES W. NELSON,	Tennessee,	Indigestion as a Cause of Caries.
HENRY S. NOBLE,	New York,	Antrum Highmorianum.
FRANCIS A. RAMSAY,	Pennsylvania,	Sensitive Dentine.
HENRY C. REGISTER,	Maryland,	Digestion.
LOUIS JOSE SALICRUP,	Porto Rico,	Extraction of Teeth.
WILLIAM SMEDLEY,	Pennsylvania,	The Fifth Pair of Nerves.
HENRY J. SMITH,	"	Sensitive Dentine.
JAMES S. THOMAS,	New York,	Chemistry.
WILLIAM H. TRUEMAN,	Pennsylvania,	Materials for Filling Teeth.
AGUSTIN DE VARONE,	Cuba,	Development of the Teeth.
JULIEN J. VANDERFORD,	Maryland,	Dentistry.
JOHN H. VEDDER,	New York,	Treatment of Irregularities.
RANSOM WALKER,	"	Diagnosis.
WILLIAM C. WARDLAW,	S. Carolina,	Anæsthesia in Dentistry.
JOHN B. WHEELER,	New York,	The Dental Pulp.
A. LAWRENCE,	Mass.	
J. M. BARRETT,	Pennsylvania.	
W. G. A. BONWILL,	Delaware.	

PHILADELPHIA DENTAL COLLEGE.

THE third annual commencement of the Philadelphia Dental College was held at Concert Hall, Philadelphia, March 1st, 1866.

The valedictory was delivered by Prof. J. Foster Flagg.

The number of matriculants for the session was forty-six.

The degree of D.D.S. was conferred on the following gentlemen by the President, Rev. Richard Newton, D.D.:

NAME.	RESIDENCE.	TITLE OF THESIS.
JOHN G. ANGELL,	Louisiana,	Scorbutus.
JACOB L. BAKER,	Pennsylvania,	Alveolar Abscess.
WILLIAM E. BIRDSALL,	New York,	Facial Neuralgia.
JOEL B. BOWER,	Pennsylvania,	Alveolar Abscess.
CONRAD DEGAN,	Germany,	Mercurial Salivation.
J. L. FORDHAM, A.M.,	New York,	Results of Inflammation.
JOHN J. HASSELL,	"	Treatment of Odontalgia.
ALLEN HALEY,	Nova Scotia,	Artificial Substitutes.
JOHN D. MOORE,	Barbadoes,	Refining Gold.
ALFRED P. MERRILL,	Massachusetts,	Facial Neuralgia.
SAXTON P. MARTIN, M.D.,	"	The Blood.
N. C. ORRICK,	Louisiana,	The Blood.
EDUARDO RODRIGUEZ,	Cuba,	Caries of the Teeth.
ALBERT H. TAYLOR,	Pennsylvania,	Crystal Gold.
J. N. WUNDERLICH,	"	Extracting Teeth.

AD EUNDEM.

THOMAS C. STELLWAGEN, D.D.S., Philadelphia, Pennsylvania.

BALTIMORE COLLEGE OF DENTAL SURGERY.

THE twenty-sixth annual commencement of the Baltimore College of Dental Surgery was held at the New Assembly Rooms, Baltimore, March 2d, 1866.

The valedictory was delivered by Prof. Thomas E. Bond.

The number of matriculants for the session was thirty-five.

The degree of D.D.S. was conferred on the following gentlemen, who composed the graduating class, by Prof. F. J. S. Gorgas, Dean of the Faculty:

NAME.	RESIDENCE.
CHARLES PORTER BAIRD.....	Tennessee.
ANDREW BENJAMIN BROOKIUS	Florida.
STANLEY BROWN	Texas.
JOHN THOMPSON COUMBE	District of Columbia.
ALBERT PHILIP GORE.....	Maryland.
WILLIAM ALBERT JONES.....	Virginia.
ROBERT PAINE NEVILL	Alabama.
THOMAS NASH READ	Virginia.
CHARLES HENRY THAYER.....	Rhode Island.
C. WATSON WESTMORELAND	Alabama.

MERRIMACK VALLEY DENTAL ASSOCIATION.

THE next regular meeting of this association will be held in Lowell, Mass., on Thursday and Friday, May 3d and 4th, 1866.

PROFESSORS MCQUILLEN and BUCKINGHAM, of Philadelphia, and other prominent practitioners are expected to be present.

The profession generally are invited to attend.

G. A. GERRY, *Secretary.*

EDITORIAL.

COMMUNICATIONS.

ISSUED as this magazine is *regularly*, on or about the first of each month, it is absolutely necessary, to secure this promptness of appearance, that all the matter for each number should be, *as it is*, in the hands of the printer by the twentieth of the month. Any article, therefore, which comes to hand after that date, cannot, of course, appear in that number; nor if, as has been the case for some months back, there is more than enough material to fill the succeeding number, can it be presented in that one, without excluding communications which came to hand before its reception. In the September and February numbers, reference was made to this fact, and it was supposed with sufficient exactness and clearness to be understood by every one, that, as a rule, to prevent confusion or cause for complaint, articles are published according to date of reception.

In this connection, one is constrained to say that articles upon the ethics of the profession or kindred topics, however ably they may be written, are not the kind of communications that the profession looks for or desires to see in every number of the magazine. There are times and occasions when the presentation of such matter may be absolutely demanded, and then it is just and proper for it to appear; but, as a general thing, introductory and valedictory addresses to students, opening addresses to societies, claims of the profession, etc., however appropriate they may have been to the occasions on which they were delivered, are, when presented in the pages of a magazine devoted to the *science* and *art* of a profession, rather out of place, and particularly so when occupying space to the exclusion of matter relating to *theory* or *practice*. The best way to advance the interests of science does not consist in talking or writing about the *necessity* of doing it, but in going to *work* and trying to do it by making some additions, however slight, to its boundaries, either by the discovery of something new, or a more accurate and comprehensive de-

scription of old facts. In future, therefore, when the publication of articles of the kind referred to are declined, it is trusted that the motive will not be misunderstood or misrepresented, for that which is meted out to one will be meted out to all.

J. H. M'Q.

COMPARATIVE ANATOMY.

It affords me much pleasure to acknowledge the recent reception of valuable specimens of COMPARATIVE ANATOMY from DR. N. C. ORRICK, of NEW ORLEANS, D. A. CUMMINGS, METAMORA, ILL., and S. S. NONES, PHILADELPHIA (along with promises of similar favors in the future), as they will aid materially in illustrating a course of lectures which I propose to deliver during the months of APRIL, MAY, and JUNE, at the PHILADELPHIA DENTAL COLLEGE, on COMPARATIVE ANATOMY. Like the extra lectures delivered by me on this department of science during the winter evenings of 1864-5, these will have decided reference to the dental organs, and will be illustrated by an extensive collection of the crania of man and the lower animals, microscopical sections of teeth and bone, drawings, etc. To accommodate students, practitioners, and others who most desire to attend, but whose engagements during the day would preclude the possibility of doing so at that time, the lectures will be delivered in the evening. The profession generally is cordially invited. The introductory lecture to the course will be delivered on Thursday evening, April 5th, 1866, at eight o'clock, and will be continued at that time until the termination of the course.

J. H. M'Q.

PHILADELPHIA SCHOOL OF ANATOMY.

THE summer session of this old institution commences MONDAY, April 2d, 1866, AT 5 P.M.

The lectures on SURGERY and SURGICAL ANATOMY will be delivered by DR. JAS. E. GARRETSON. Those on DESCRIPTIVE ANATOMY, by DR. STANSBURY SUTTON.

The reputation of this institution, and the gentlemen connected with it, is so well established, that it is not necessary to do more than announce the fact that the session will open at the time named.

J. H. M'Q.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION.

It is due to the Publication Committee of the AMERICAN DENTAL ASSOCIATION that the members of the Association should be informed that the non-appearance of the Transactions is not owing to any dere-

liction on the part of the committee, as immediately after the adjournment last summer they were prepared to proceed at once to the discharge of their duty, and made all necessary arrangements for that purpose, obtaining estimate of cost of printing, etc.; but they have been prevented from accomplishing their desires, on account of the fact, that as yet no portion of the stenographic report of the proceedings has come to hand, although the gentleman employed to make the report has been written to frequently about it. The cause of the delay is unaccountable to the committee, but they trust that good and valid reasons can be given.

J. H. M'Q.

CORRESPONDENCE.

IN the January number of this magazine, exceptions having been taken by me to some statements made in one of the communications, the following correspondence supervened:

XENIA, O., January 13th, 1866.

PROF. J. H. MCQUILLEN.

DEAR SIR:—In the last issue of the DENTAL COSMOS, in speaking of the late meeting at Chicago, I affirm that “a prominent and talented member told us of queen bees being reared from the larvæ of drones, simply by a change of diet.” On page 319 of the same number, you affirm that “no such position was assumed by any one at the meeting.” Here is a sharply defined question of veracity between us,—too sharp to rest on. I have met with but six members of the ASSOCIATION since the arrival of the DENTAL COSMOS. They state, *unanimously*, that “such position was assumed by one at the meeting.”

Will you *frankly* retract and apologize in the next number? or will it be necessary for me to defend myself by exhibiting you to *yourself* and the rest of the profession? I shall expect YES or NO as an answer; and will patiently wait for it till the 25th instant, without taking any steps in the matter.

It may be satisfactory for you to know that I conversed with the member, who assumed the position in dispute, in regard to his assumption; that he admitted his error, and that I supposed he would ask leave to correct it before the final adjournment.

That this matter may be promptly and *cordially* adjusted, is the earnest wish of

Yours,

GEO. WATT.

1112 ARCH STREET, PHILADELPHIA,
January 18th, 1866.

PROF. WM. H. ATKINSON.

DEAR DOCTOR:—Will you have the kindness to inform me, by return mail, whether my statement of the position assumed by you, in the AMERICAN

DENTAL ASSOCIATION, with regard to the *larva* of *neuter* or *working bees* being developed into *queen bees* by the stimulating food known as *royal-jelly* is substantially correct? My reasons for asking the question, and desiring a prompt answer, will be apparent by reading the accompanying copy of a note received this day from Prof. Watt.

Truly yours,

J. H. MCQUILLEN.

No. 109 NINTH STREET, NEW YORK,
January 19th, 1866.

DEAR MCQUILLEN:—Yesterday's note, containing copy of a note from Prof. Watt, is before me, to which I reply, that you have saved me the necessity of responding to Watt, as you reported me as saying just exactly what I meant to say.

Watt did charge me at Chicago with saying that "royal jelly" changed the sex, which I denied having said or meant. I cannot now more than then state just what I did say; but I know what I meant then and now.

I think your stricture correct, just, and necessary. If you understood me to say at Chicago just exactly what I meant to say, I am satisfied that the misapprehension was of the ears of those listeners who now say that I put forth babbling nonsense. If they understood me to say what they now say I said, there is but one conclusion to come to of two, both uncomplimentary to them: 1st, they either did not know I was wrong, or, 2d, they did not care enough for so important a truth as to advocate it against false "authority." As ever,

ATKINSON.

No. 1112 ARCH STREET, PHILADELPHIA,
January 20th, 1866.

PROF. GEO. WATT.

DEAR SIR:—Yours of the 13th, postmarked the 15th, came to hand on the 18th. In response, I do not regard the question between us as one of *veracity*, but of *apprehension*. Knowing how often speakers are misapprehended by listeners, I inferred at the time when I read your article, that you misapprehended the meaning of the speaker, and my comment on your article was written by me under that conviction. As I still believe that to be the case, I, of course, must decline to accede to your request to "retract."

I was seated near the speaker at the time, and followed his remarks with marked attention, for he was speaking upon a subject in which I was deeply interested, and with which I was quite familiar. Had I understood him to assume any other position than that which I have accorded to him, I should have corrected him on the *spot*.

My comment in the last number of the DENTAL COSMOS was made without consulting any one, and merely drawing upon my remembrance of the occurrence. Since the receipt of your note, I have received corroboration.

rative evidence that my rendition of the position assumed is substantially correct.*

With regard to the "apology" which you demand, I would say that I am not in the habit, intentionally or unintentionally, of insulting any one. Regarding such acts as the only conditions which warrant an apology from a gentleman, I shall never withhold one, but on the contrary, would only be too happy to offer the most ample reparation in that way when convinced that I have done that which calls for such admissions.

With respect to your remark, "Or will it be necessary for me to defend myself by exhibiting you to *yourself* and the rest of the profession?" I trust that you will not hesitate to do so, if you should think I am of sufficient importance for you to occupy your valuable time and attention in that way, and believe that it would be of any advantage to you, the profession, or the one you propose to make a subject of comment.

As in the preparation of my communication I had no desire to rupt the harmony which I have considered as existing between us, so now I have no other desire or wish than that the most friendly relations should continue to unite you and

Yours truly,

J. H. McQUILLEN.

In connection with the above, as evidence of the kind regard entertained and manifested by me for the writer, I would refer to the DENTAL COSMOS, May and August, 1865.

While, however, thus ready, as on the occasions named, to freely acknowledge my appreciation of the efforts of fellow-laborers in the field of science, as an independent journalist, who, in the faithful discharge of the duty which he owes to the profession, recognizes neither *friendships* nor *enmities*, and believes that in intellectual as in physical operations *differentiation* is a *law of progress*, I never have, nor shall hesitate to take exceptions to views, advanced by whomsoever they may be, which I *deem* to be erroneous and of sufficient importance to claim attention. Fully recognizing my own fallibility, and perfectly willing that my errors and imperfections shall be freely criticised and corrected, I trust that, in the future as in the past, when engaged in controverting the *opinions* or *ideas* of others, I shall never so far forget what is due to the profession, or myself, as to engage in anything like personal crimination and recrimination with any one; as life is too short for such encounters, and one should value his *time* and *opportunities* for self-improvement too highly to waste them in that way.

J. H. M'Q.

* A number of gentlemen who were present at the meeting have written to me stating in the most emphatic manner that they understood the matter as I did.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"On a New and Ready Mode of producing Local Anæsthesia. By BENJ. W. RICHARDSON, M.A., M.D., F.R.C.P., Senior Physician to the Royal Infirmary for Diseases of the Chest.—Some years ago I published in the columns of the *Medical Times and Gazette* some researches for the production of local anæsthesia by a process which I designated voltaic narcotism. Those researches, very much praised on the one hand, and very rudely and unfairly attacked on the other, failed in the end in leading me directly to any practical means of producing local insensibility applicable to surgical proceedings. The causes of failure were threefold. The apparatus required was cumbersome; the application was painful; the result was uncertain. In the course of the past year a similar series of experiments have been made by an Italian physician; but whether in imitation of my previous labors or in ignorance of them, I do not know: they have proved equally unsatisfactory.

"The researches on voltaic narcotism, although practically of little value, were not in reality without their use. Previously to making them I was quite conversant of the fact—indeed, I learnt it from Snow—that all the narcotics produced anæsthesia by the process of arresting oxidation; but I had still to learn what Snow himself had not reached, that arrest of oxidation meant, in the end, arrest of motion; and that anæsthesia, in truth, means the temporary death of a part influenced—*i.e.* inertia in the molecules of the part.

"Learning this, I discovered that voltaic narcotism had at its base a fault. My idea in it was, that by quickening the circulation of a part by galvanic stimulus, and by applying over the part where circulation was quickened a narcotic solution which the blood could absorb, I could so charge the blood locally with narcotic substance as to produce local insensibility. In feeble subjects, as the result proved, local narcotism could, in this way, be temporarily set up; but it was always attended with a certain amount of disorganization. In strong subjects it failed altogether, because such of the narcotic as might be absorbed was carried rapidly into the general circulation. In plain words, by the use of the galvanic current, I was committing the paradox of applying a form of motion for the indirect production of inertia.

"The failures I experienced at the period referred to in no degree lessened my efforts to find a practical means for producing local insensibility. They simply caused me to think more on the whole subject, and to invent new methods of inquiry. I came at length to the conclusion that Dr. James Arnott's plan of using extreme cold was the first true step in the progress of discovery, and that if it could be made easier of application, and at the same time could be combined with the use of a narcotic fluid, an important advance in therapeutics would necessarily follow. For full four years this truth has been before my mind, and I have made numerous experiments with the view of demonstrating it. At one time I tried to freeze parts by the application of ice and salt, and then to inject by the

hypodermic plan narcotic solutions into and beneath the frozen tissue. These experiments were never sufficiently satisfactory to allow of their publication. At last I hit upon a method which I am now about to describe, and which, although admitting of very considerable improvement, is sufficiently important to justify me in laying it before the profession.

"The Anæsthetic Spray-Producer.—When the toy for diffusing eau de cologne in fine vapor over the skin, in the form of spray—which some time ago found its way into our drawing-rooms—first came before me, it struck me at once that it might possibly be applied to the production of local anæsthesia; and I set to work to try its applicability in this respect. I was soon afterward assisted largely in my labors by taking advantage of Siegle's apparatus, with the hand-ball spray-producer invented by my valued friend Dr. Andrew Clarke, and supplied by the manufacturers, Messrs. Khroné and Sesemann, of Whitechapel Road.

"With this apparatus I set myself to determine the degree of cold that could be produced by the vaporization of all the known volatile liquids, and I determined the fact that the intensity of the cold produced held a definite relationship to the boiling point of the fluid used; the rule being that the lower the boiling point the greater was the amount of cold exhibited. In these inquiries I employed a very delicate thermometer, directing the spray upon the bulb from half an inch to an inch and a half from the point of the jet. By these means I learnt that with rectified sulphuric ether I could bring down the thermometer within 10 degrees Fahr. of zero, and that by directing the jet on the skin I could produce a certain definite and marked degree of local insensibility, but not sufficient for surgical purposes.

"I next got Mr. Krohne to construct for me a hollow cylinder of thin metal, six inches long and three inches in diameter. In the circumference of this cylinder was a chamber one-eighth of an inch in diameter for containing ether. The ether communicated with a tube which was joined to an air tube, as in Siegle's apparatus, and the centre of the cylinder was filled with ice and salt mixture. In this way the ether was reduced to zero, and when vaporized gave spray which brought down the thermometer six degrees below zero, and produced on the skin such entire insensibility that I could pass a needle through the part without sensation. On the 11th of December, 1865, I applied this process for the first time on the human subject for an operation. The patient was a lady, who required to have five front teeth extracted. I had previously administered chloroform to this lady for a tooth extraction, but the inhalation had produced so much irregularity in the action of the heart and other disagreeable symptoms, that I considered it inadvisable to repeat chloroform, and she herself was only too ready to give the local measure a trial. The extraction was performed by my friend Mr. Peter Matthews. On directing the ether spray first at a distance and then closely upon the gum over the first central incisor on the left side, we observed, at the end of fifty seconds, that the gum had become as white as the tooth itself, and quite insensible. I then directed the vapor upon the tooth for twenty or thirty seconds more, and on the patient intimating that she did not feel, I suggested to Mr. Matthews to proceed. He extracted a very firm tooth without the slightest expression of pain. The process being continued in the same manner, he extracted three other teeth with the forceps. The fourth gave way, and had to be removed by the lever; but in all cases

the result was equally good. Not a drop of blood was lost; there was no painful reaction; and the healing process proceeded perfectly. Our patient, who was exceedingly intelligent, was specially requested to note every step of the operation, such as the applying of the forceps, the insertion of the blades beneath the gum, the loosening process, and the removal. She told us that in two of the extractions she felt nothing; that in one it seemed as though the jaw altogether were being pulled downward, but without pain; that in another she was conscious of a kind of wrench or loosening but without pain, and that the introduction of the lever was attended with a momentary dull ache, just perceptible. On the whole, the process was quite as painless as when she took chloroform.

"On December 13th I applied the local anæsthetic to the same lady for the further extraction of nine teeth, Mr. Peter Matthews again operating. The results were equally good with the first seven, at which point, unfortunately, the apparatus partly ceased to play. At the eighth tooth pain was felt, and at the ninth, the apparatus being out of play, the operation caused great pain. We regretted this much, although it gave us the information of the perfect action of the process when no mechanical action interfered with it. The reason why the apparatus stopped play was very singular, and could hardly have been foreseen. It arose from the condensation of water derived from the air in the air tube, and from the blocking up of the fine jet with a little portion of ice.

"In the next step of research I got Mr. Krohne to make for me an apparatus with two spiral tubes, one the air tube, the other a tube for ether; and I immersed these spirals in a closed chamber filled with ice and salt. The degree of anæsthesia at first produced was most intense, and Mr. Spencer Wells was good enough to allow me the opportunity of applying the process in a case where an operation was required for closing a perineal rupture. Unhappily the apparatus, from the very same cause as before, ceased to yield a current; water condensed and became frozen in the air tube. The apparatus itself was also found to be too cumbersome for practical purposes; I therefore, in this trial, failed to obtain any result.

"By this time I had been led, very reluctantly, to the fact that the use of ice and salt for reducing the ether was a failure when the plan came to be tried in practice, nor could I see any ready way of preventing the difficulties that were brought before me. Added to these difficulties there was another, which has always attended my friend Dr. Arnott's plan, viz., that of getting the ice and salt readily for operation. To succeed, therefore, it was requisite to dispense with ice and salt altogether.

"In considering how this object could be achieved, it occurred to me that if a larger body of ether than is supplied by Siegle's apparatus could be brought through the same jet, by mechanical force, in the same interval of time, and with the same volume of air, a proportionate increase of cold must necessarily be produced. The theory was one of pure physics, admitting even of arithmetical demonstration, and running parallel with the lessons which had been taught me with respect to the cold produced by liquids having different degrees of boiling point. The theory was put to the test at once, and proved correct to the letter. By driving over the ether under atmospheric pressure, instead of trusting simply to capillary action—or to suction, as in Siegle's apparatus—the spray evolved brought the thermometer within thirty seconds to four degrees below zero—the result that was desired.

"Ascertaining this truth, I instructed Messrs. Krohne and Sesemann to construct a very simple apparatus consisting of a graduated bottle for holding ether; through a perforated cork a double tube is inserted, one extremity of the inner part of which goes to the bottom of the bottle. Above the cork a little tube, connected with a hand bellows, pierces the outer part of the double tube, and communicates by means of the outer part, by a small aperture, with the interior of the bottle. The inner tube for delivering the ether runs upward nearly to the extremity of the outer tube. Now, when the bellows are worked, a double current of air is produced, one current descending and pressing upon the ether forcing it along the inner tube, and the other ascending through the outer tube and playing upon the column of ether as it escapes through the fine jet. By having a series of jets to fit on the lower part of the inner tube, the volume of ether can be moderated at pleasure; and by having a double tube for the admission of air, and two pairs of hand bellows, the volume of ether and of air can be equally increased with pleasure, and with the production of a degree of cold six below zero.

"By this simple apparatus, at any temperature of the day and at any season, the surgeon has thus in his hands a means for producing cold even six degrees below zero; and by directing the spray upon a half-inch test-tube containing water he can produce a column of ice in two minutes at most. Further, by this modification of Siegle's apparatus he can distribute fluids in the form of spray into any of the cavities of the body—into the bladder, for instance, by means of a spray catheter, or into the uterus by an uterine spray catheter.

"When the ether spray thus produced is directed upon the outer skin, the skin is rendered insensible within a minute; but the effects do not end here. So soon as the skin is divided, the ether begins to exert on the nervous filaments the double action of cold and of etherization; so that the narcotism can be extended deeply to any desired extent. Pure rectified ether used in this manner is entirely negative; it causes no irritation, and may be applied to a deep wound, as I shall show, without any danger. I have applied it direct to the mucous membrane of my own eye, after first chilling the ball with the lid closed.

"I have now employed this mode of producing local anæsthesia in four cases on the human subject. The first case was the extraction of a tooth from a lady, the operation being performed by my friend and neighbor Dr. Sedgwick, on January 24th of this year. On the 29th of the same month I used it again on the same lady for the extraction of three very difficult teeth, Dr. Sedgwick again operating. The results were as satisfactory as in the previous case, where the ice and salt ether apparatus was used.

"I have used the apparatus also in connection with my friend Mr. Adams, who had a case at the Great Northern Hospital of deep dissecting abscess in the thigh of a young woman. In the abscess there was a small opening, which just admitted the director. I first narcotized around this opening, and the director being introduced, Mr. Adams carried his bistoury nearly an inch deep and one inch in the line of the director. I then narcotized the deep-seated parts, and enabled him to cut for another inch and a half in the same direction. The director was then placed in the upper line of the abscess, the process was repeated, and the incision was carried two and a half inches in that direction. The patient was entirely unconscious of pain, and after narcotizing the whole of the deep

surface, Mr. Adams inserted his fingers and cleared out the wound without creating the slightest evidence of pain.

"Afterward, in the case of a lacerated wound, six inches long, in the arm of a boy, who had been injured with machinery, I narcotized while six sutures were introduced by Mr. Adams. The first needle was carried through without the anæsthetic, and caused expression of acute pain; the remaining eleven needles, after a few seconds' administration of the ether spray, were passed through painlessly. The twisting of the wire sutures gave no pain.

"These results are so interesting that I make no apology for bringing them at once before my medical brethren. I wish it to be distinctly understood that at the present moment I only introduce the method here described for the production of superficial local anæsthesia. It is, I believe, applicable to a large number of minor operations, for which the more dangerous agent chloroform is now commonly employed—I mean such operations as tooth extraction, tying nævus, tying piles, incising carbuncles, opening abscesses, putting in sutures, removing small tumors, removing the toe-nail, dividing tendons, operating for fistula, removing cancer of the lip, and other similar minor operations which I need not mention. The process may also be applied to reduce local inflammation.

"In course of time, and guided by experience and the advancement of science, we may, however, expect more. If an anæsthetic fluid of negative qualities, as regards irritation of nerve, and which has a boiling point of 75° or 80° , can be obtained from the hydro-carbon series, the deepest anæsthesia may be produced, and even a limb may be amputated by this method. It may also turn out that certain anæsthetics may be added to the ethereal solution with advantage, such as small quantities of chloroform, or some of the narcotic alkaloids, if they could be made soluble in ether. A solution of morphia and atropia combined, if they could be diffused through ether, which at present seems impossible, could thus be brought into action so as to cause deep insensibility. In operating on the extremities it would be good practice to stop the current of warm blood by making pressure above on the main artery.

"Reaction from the anæsthesia is in no degree painful, and hæmorrhage is almost entirely controlled during the anæsthesia.

"One or two precautions are necessary. It is essential, in the first place, to use pure rectified ether; methylated ether causes irritation, and chloroform, unless largely diluted with ether—say one part in eight—does the same.

"The *modus operandi* of this process is exceedingly simple. It acts at first merely by extracting force, and afterward, when the nervous filaments are exposed, by preventing the conveyance of force through them. To be plain, sensation means the conveyance of force or motion from the extreme parts to the brain. The motion is communicated by the blood in the form of heat: it is communicated to the nervous filaments, and by them is conveyed to the sensorium. This is passive sensibility. When we irritate a nervous fibre, as by a cut, we communicate more motion rapidly along that fibre and cause pain. This is active or exalted sensibility. To remove sensibility, therefore, we must adopt one of three processes: we must remove or render inert the sensorium; we must stop the evolution of force generally by arresting oxidation of blood; or we must rob the body locally of its force beyond that with which it is constantly being renewed. We see the first of these processes in action in

cases of pressure on the brain, as from injury or effusion of blood; we see the second whenever we produce general anæsthesia by charging the blood with chloroform or other analogous anæsthetic; and we see the third when, by means of extreme cold, we rob the local part of the force that has been brought to it by the blood.

"The problem of local anæsthesia will consequently be quite solved when by a rapid process we can exhaust the natural force of a part as fast as such force is evolved in the local structure; and especially when with this we can combine the action of a substance which for the moment controls, as by compression, the conducting power of nerve matter. These two latter objects are to a large extent carried out by the method I have described above."—(*Med. Times and Gaz.*)

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Local Anæsthesia by the Vapor of Ether.—MR. H. T. KEMPTON gives in the *Med. Times and Gaz.* the following additional testimony in favor of this method of producing local anæsthesia: "Having expressed myself interested in the inquiry, Dr. Richardson kindly invited me to test the efficiency of his proposed method by operating upon a patient who was desirous of having two very sensitive and painful stumps of the upper bicuspid and a lower molar tooth removed. I gladly availed myself of his offer, and will now give a simple statement of the result, leaving it to my fellow-practitioners to draw their own conclusions; only trusting they will thoroughly examine for themselves a remedy which I confidently believe will prove of the highest value generally, and of especial value in dental surgery.

"A gentleman about thirty years of age had suffered for several weeks from severe pains on the right side of both the upper and lower jaws alternately. In the upper jaw the pain was caused by the irritation excited by the stumps of the first and second bicuspid; in the lower jaw by the first molar, which was much decayed, having the pulp exposed. Both of the upper stumps, as well as the lower molar, were highly sensitive to the slightest touch, showing that the disease had extended to the dental periosteum. The elevator was used in extracting the upper stumps after the diffused ether vapor had been applied for a period of not more than thirty seconds; no pain was experienced, and although the bleeding was tolerably free, it became arrested at the ordinary period after similar operations. The current was then applied to the lower molar, and here I would remark that, on entering the cavity of the tooth and acting on the exposed pulp, it gave rise to acute pain; on observing this, the application of the ether was suspended, and the cavity plugged with cotton wool so as to prevent the spray coming in contact with the exposed pulp. The ether vapor was then reapplied for a period of forty seconds, and the tooth extracted with an equally satisfactory result as in the previous operations."

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"Local Anæsthesia by Narcotic Spray. By BENJ. W. RICHARDSON, M.A., M.D., F.R.C.P.—Since the publication of my original paper on the 'New Method of Producing Anæsthesia' (*Medical Times and Gazette*, February 3), I have made one or two observations of importance to which I would direct immediate attention.

"I. I find that all the ordinary ethers of the shops contain alcohol, the

presence of which substance materially interferes with the success of the process; it prevents perfect anæsthesia, and it causes tingling and burning sensation at the beginning of the process and during the brief period of reaction. I would, therefore, point out that before practitioners resort to the process they test the purity of the ether they are about to use, by the following simple experiments:

"*Tests for Ether.*—(A) Take the specific gravity. The specific gravity should not exceed 0.723.

"(B) Try the boiling point. Warm the hands by gently blowing into them the warm breath. When the hands feel as warm as the breath, make the palm of one hand into a cup and pour in one or two drachms of ether. The ether ought immediately to boil briskly without giving any pain.

"(C) Test the effect on mucous membrane. Put one or two drachms of the ether in the palm of the hand and quickly take up the ether into the mouth with the tongue. The ether should at once pass off, leaving neither smarting nor burning, nor any sensation except a slight coldness.

"(D) Pour a little of the ether on a piece of clean white blotting-paper and lay the blotting-paper on the warm hand. The paper should dry within a minute, leaving no moisture and no smell whatever. If the paper, while drying, yield an odor like eau de cologne, there is some alcohol present. If it give a smell slightly pungent, and which hangs about for a time, there is some methylated compound present. Perfectly pure ether, in a word, leaves no persistent odor.

"(E) Try the degree of cold producible by the ether. Charge the bottle connected with the spray-producer, and direct the spray on the bulb of a thermometer. The mercury ought to fall rapidly to six degrees below zero Fahr., and the falling of the mercury should continue until there is a deposit of snow on the bulb of the thermometer from condensation of water in the air.

"(F) Test the effect on the skin. Direct the spray, at a distance varying from half an inch to an inch and a half from the jet, on the back of the hand. In a space of time, extending from thirty seconds to two minutes, a slight hoar-frost deposit should form on the skin, followed immediately by a diffuse blanching. The skin is at this moment altogether insensible.

"(G) Test the reaction of the ether by litmus. The reaction should be neutral.

"These are the ready and necessary tests. A pure ether answers to all of them, and no other ether ought to be used.

"For a little time the profession may experience a difficulty in obtaining pure ether, because it is not commonly vended. At the same time, as there is nothing more required than repeated rectification to render ether quite pure, it will be produced so soon as there is a demand; and although the prime cost will be increased, it will be saved in the end, because the quantity of ether required for each operation is reduced in proportion to the purity of the fluid. Already, indeed, Mr. Robbins, of the firm of Garden & Robbins, of Oxford Street, has, with his usual promptitude, produced for me an ether which bears all the tests I have described above.

"II. I have observed in producing local anæsthesia by this new process that the peculiar hardness of the skin which occurs when the freezing mixture of ice and salt is applied, does not occur. The tissues, on the

contrary, are comparatively lax, so that difficult dissections may be carried on with ease and nicety.

"III. I have found during the last few days that the application of the narcotic spray to parts of the body subject to neuralgic pain gives immediate relief.

"I have only to add, in conclusion, the gratifying intelligence that I have now applied the local anæsthetic in forty-three minor operations with a result of complete success in thirty-six cases, and with more than partial success in the remainder. In those cases where the success has not been absolute, the result has been due to imperfection either in the ether or apparatus, or to deficient experience (unavoidable in all preliminary inquiries) in the mode of application. The reaction has been rapid, painless, and satisfactory."—(*Ibid.*)

Anæsthesia by Mixed Vapors.—"MR. R. ELLIS draws attention, in the *Lancet*, to a new method of administering chloroform; he uses alcohol first, then ether, and then chloroform. By means of an ingeniously contrived instrument, he is enabled to present either of the anæsthetics separately or united without changing the apparatus."—(*Dublin Med. Press and Cir.*)

"Large Ranula; Injection of Compound Tincture of Iodine; Cure. By WM. MARTIN COATES, M.R.C.S., Surgeon to the Salisbury Infirmary. —Ellen M——, a patient in Salisbury Infirmary, aged ten. Just below the base of the lower maxillary bone on the left side, extending from the angle nearly to the symphysis, there was a soft doughy swelling. At first sight and touch its nature was not apparent; but on making pressure (her mouth being open) on the tumor below, so as to force upward the mucous membrane covering it between the tongue and jaw, it was seen and felt to be a large ranula.

"June 11th, 1865.—I injected from within the mouth, by means of Wood's syringe, fifteen minims of compound tincture of iodine into the tumor. On withdrawing the needle, a drop of the fluid peculiar to ranulæ oozed from the puncture.

"12th.—A little hardening of the swelling, but no pain.

"21st.—Tumor rather smaller. On this day I injected thirty minims of the tincture from without by means of Wood's syringe.

"22d.—There is considerable hardening of the ranula, and some tenderness on handling it.

"From the last note the tumor daily diminished, and on the 15th of July it could not be either seen or felt.

"I cannot find by reference to those works of surgery in my possession that the cure of ranula has been attempted by the injection of iodine. I therefore have assumed that the idea is an original one of mine. It is so simple, so painless, so free from danger and annoyance, that I have ventured to place it among my interesting cases. It is true that one case is too small a basis on which to found a treatment; but as there must be a first case, and as ranula (according to my experience) is not a common affection, I publish it in the hope that others may give it a trial; and perhaps, in the future, those suffering from this disease may escape, through my means, incision, excision, the cautery, the seton, the opening it in its whole length and stuffing it with lint, or the platina tubes of Dupuytren,

—all of which must result more or less in failure, pain, bleeding, or distressing salivation.”—(*Lancet*.) —

Salivary Fistula of Steno's Duct.—In a notice of DR. VAN BUREN'S work on Practical Surgery, the *Brit. and For. Med.-Chir. Rev.* states that “the book closes with an account of a *Complete Salivary Fistula of Steno's Duct* following a gunshot wound, and cured by an ingenious operation which Dr. Van Buren had himself learned. After the operation much inflammation of the parotid gland and other parts occurred, that of the gland resulting from an experiment made with a view of testing the assertion of Bernard, of Paris, that the injection of any fatty substance into the duct of the parotid will arrest its secretion and produce atrophy of the gland. In this case the fistula was injected with melted lard previous to the operation, ‘but the result was negative,’ as at the end of nine months the gland was ‘secreting freely as ever’ by means of the new duct, whose orifice was seen discharging saliva into the mouth.”

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“Fibrous Tumor of the Hard Palate; Operation; Removal. By SIR WM. FERGUSSON. Communicated by Dr. G. de Gorrequer Griffith. —The patient was a young, healthy, and strong-looking man. The tumor had been noticed for some time, but only of late had it taken on rapid growth.

“Sir Wm. Fergusson remarked that such tumors as the present were extremely rare; so exceedingly rare that in the entire of his professional experience he had only seen three or four; that the growth in question at first sight seemed to have commenced in the antrum, and to have thence spread until it had perforated the hard palate and projected into the mouth. Viewed as a tumor originating in the antrum, it was curious that it should have projected in no other direction than the mouth; and this fact of the direction which it had taken made Sir Wm. Fergusson entertain doubts as to its being in connection with the antrum. Again, it was so soft, and yielded such a sensation of fluctuation that, to some who examined it, it seemed an abscess pointing toward the mouth. Because of this sensation, Sir Wm. Fergusson made an exploratory puncture into the swelling previous to commencing the incision necessary for its removal; and then, finding his diagnosis correct, proceeded to complete the operation by excising the fibrous mass.”—(*Dublin Med. Press and Circ.*)

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“Superior Maxillary Bone.—Removed from a woman resident in Malta, exhibited by MR. CANTON to the Pathological Society of London. The disease had commenced about three years ago after a blow. When seen, the teeth were loosened, the palate softened, and a fungoid mass projected against the nostril. Two partial operations had been previously performed, and a more radical one was undertaken only at the patient's urgent desire. After the bone had been removed, there appeared at the back of the chasm a mass of gelatinous material, like the ordinary nasal polypus. This, however, was entirely scooped out by the fingers, and gave exactly a mould of the sinus of the sphenoid bone. The patient has made, so far, a good recovery, and has returned to Malta.”—(*Med. Times and Gaz.*)

"*Restoration of the Lower Jaw after its Entire Removal.* By THOMAS SMITH.—The title of this paper in Saint Bartholomew's Hospital Reports does not fully explain its character. It is a record of a case where a necrosed lower jaw was removed, prior to which the foundation of a new one had been laid by the efforts of nature. The opinion of the author is that the soft tissues furnished the material out of which the new bone was constructed, and that the periosteum took no part in the process. We may be pardoned for doubting the accuracy of the author's conclusion."—(*Ibid.*)

"*The Mechanism of Surgery.*—There are two subjects to be considered in a case of a broken bone: the first is, the *diagnosis*, to discover the extent and state of the fracture, which is the business of the anatomist; the other is, the *mechanical means* to put the bone into its proper shape, and hold it steadily together, so that it may be reunited by the process of nature; and, when the reunion is effected, be in its original shape, and not deformed; this part of the work is mechanical, and in some cases has been performed by mechanics much better than by very able surgeons who were not familiar with mechanical inventions and appliances.

"Mechanical dentists have relieved patients whom skillful surgeons had failed to relieve, in cases of difficulty in the palate, and in some cases of broken jaw. Among these cases is that of Mr. Seward, Secretary of State. He was thrown from his carriage on April 5th, 1865, and his jaw was broken on both sides. He was treated in the old way, without success, until the 14th, when, at the suggestion of the chief surgeon of the Navy Department, Mr. Frederick Seward wrote to Dr. Thomas B. Gunning, of New York, stating the case to him, and asking whether he could give the desired relief. On the evening of that day the assassin Paine made the case much more difficult by cutting open the face of the patient, the knife passing through the fracture on the right side. Air was admitted to the bone, in consequence of which its vitality or faculty of reuniting was greatly impaired. The news of the assassination of the President occasioned Dr. Gunning to be absent from his office on the 15th. Meantime telegrams were sent, requesting him to attend immediately upon Mr. Seward; but were not received by him until late; and he did not arrive in Washington until the morning of the 16th. He examined the case, and proposed a mode of treatment which was disapproved by the surgeons in attendance. The treatment of the surgeons had not the success hoped for; and, twenty-nine days after the fracture, when the distinguished surgeons (one the Surgeon-General of the War Department) had acknowledged their failure, Dr. Gunning was requested to undertake the case. At this time the chin hung loose, the fractures on both sides being in such a state as rendered the case far more difficult than it would have been at first, or even at the time Dr. Gunning was called.

"The treatment consisted in holding the three parts of the broken jaw in their proper positions relative to each other. This was effected, first, by means of the teeth, which were connected by wires, temporarily, so that a *form* or mould of the teeth and gums could be taken in wax, in the way usual with dentists; from this form a plaster mould was cast; and upon the plaster a form of vulcanized hard rubber was made, having imbedded in it two wings of steel, by which it could be held by tapes to a cap well fitted upon the head. Into this form the teeth and gums, upper and

lower, were fitted, and held until the bone was united, and the *splint*, as it is technically called, could be safely removed. The success of the treatment was greater than the surgeons anticipated, considering the state of the case, after twenty-nine days' delay, and the aggravation of it by the assassin's knife.

"Dr. Gunning has had many cases, in which he was called in time, in which he has applied these mechanical splints to the teeth, as a means of holding the broken parts of the jaw together. In some cases it is necessary to drill into the teeth a little, to admit the ends of set-screws, to hold the teeth firmly in the splint. In all cases when he has been called in time, he has been entirely successful; and in many cases, after surgeons have failed, he has succeeded.

"The efficiency of his treatment is in the mechanical ingenuity and expertness by which he puts and holds the fractured bones together. When all the teeth are sound, it is unnecessary to hold the lower jaw to the upper. When the jaws must be held together, a hole is made in the splint, through which the food passes; and there are small holes for cleansing, by means of a syringe.

"This is a new branch of mechanical engineering, or exercise of mechanical ingenuity, which may be worthy of study."—(*Amer. Artisan.*)

"Excision of the Tongue. By JAMES SYME, F.R.S.E., Surgeon in Ordinary to the Queen in Scotland, and Professor of Clinical Surgery in the University of Edinburgh.—About twelve months ago I communicated a case in which the tongue had been completely removed by excision on account of extensive disease that threatened to prove fatal by preventing the admission of nourishment. This account was necessarily limited to the operation and its immediate effects, as sufficient time had not elapsed for determining whether or no the relief afforded would prove permanent, or how far the powers of deglutition, articulation, and taste would be restored. After his return home to Manchester, the patient sent me favorable reports of his progress, but certainly not such as to convey any adequate idea of the improvement that had taken place since he came under my care. He was then emaciated and bent down by long-continued suffering, unable to articulate, so as to require a slate and pencil for expressing his wishes, and swallowing even fluids with such extreme difficulty as to feel on the point of starvation. My surprise may, therefore, be imagined when on the 10th of September last he unexpectedly made his appearance, erect and vigorous, and, seeing that I did not recognize him, announcing his name in a loud, clear voice. The feeling thus excited was not lessened by learning that while traveling in the Highlands he had dined at table d'hôtes, and entered into conversation without betraying the deficiency under which he labored. Very much astonished by a result so much better than could have been anticipated, I requested a number of my medical friends to join me in examining the state of matters. Professor Goodsir and Mr. Nasmyth having satisfied themselves that no vestige of the tongue remained, various observations were made with regard to articulation and other functions of the absent organ; and Mr. Annadale afterward instituted a more particular inquiry, of which he has given me the following report:

"The lips and jaw-bone, where divided, were soundly united without any deformity. The opening between the mouth and pharynx was much

diminished in size and irregular in shape from contraction of the fauces and soft palate, which were drawn downward and forward more to the right than the left side, from the mucous membrane at that part having participated in the disease and been removed along with the tongue. Mr. W—— says that he can swallow as well as ever, provided that the food is either finely divided or fluid. He is also able to masticate solid substances, although difficulty is sometimes experienced from their getting into awkward parts of the mouth. In ordinary speech his words are wonderfully clear and distinct, and he can sing without any difficulty. All the vowels and words composed of them are articulated perfectly, and also the following consonants: B, C, F, H, K, L, M, N, P, Q, R, V, W. D is pronounced "dthe," J "the," G like "sjee," "S" is a lisp. His taste is impaired, but still enables him to distinguish different articles and their respective qualities, as grouse from partridge, bitters from sweets, good beer from bad beer, etc. He has remarked that the seat of sensation lies somewhere in the throat, since there is no recognition of taste previous to the act of swallowing; and, in order to ascertain the truth on this point more precisely, the following experiments were made:

"1. A strong solution of salt was applied by means of a camel-hair brush to the fauces, palate, floor of the mouth, lips, and inner surface of the cheek, with the result of something being felt in the mouth, but no idea formed as to its nature.

"2. About a quarter of a teaspoonful of finely-powdered sugar was placed on the floor of the mouth, and, having been allowed to remain there a few seconds, was then brought thoroughly into contact with every part of the cavity without any recognition of its nature; but when a little water was added and swallowed, the taste was immediately perceived.

"3. The same experiment was repeated with another substance (salt), and with the same result."

"It has long been known that large portions of the tongue may be removed without destroying or materially impairing the power of articulation, but I am not aware of any case on record in which it has remained so perfect after complete removal of the organ. Of the facts above mentioned, the one that seems most curious is the connection between taste and deglutition; from which it appears that the latter is essential for the full perception of the former. If the pleasure of taste could be perfectly gratified by mastication without deglutition, there would be no limit to the consumption of food; but the instinctive desire to swallow an agreeable morsel affords a check to any such abuse.

"As the nature of the disease was not particularly described in relating the operation, a representation of the microscopic structure exhibited by the tumor (for which I am indebted to Mr. Annandale) may be given, to show that it possessed the characters of epithelial cancer."—(*Lancet*.)

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Galvano-caustic Knife.—"At the Société de Chirurgie, M. Broca exhibited a new galvano-caustic knife, invented by M. Séré, of the Military Hospital at Vincennes. The blade of this knife, formed of platinum, can be heated as high as 1500° C. by the passage of a galvanic current from Grenet pile. Platinum being a soft metal, this blade has no cutting edge, but it acquires an excellent one under the influence of the electrical heat, which instantly communicates to it a special temper, the blade again

becoming blunt upon the abatement of the heat. At 1500° , a white-red heat, the vessels cleanly divided remain open, and the blood issues freely out. The instrument is, in fact, graduated from 1500° to 600° , the heat being increased or diminished by a very simple procedure, which consists in elongating or shortening the portion of platinum comprised in the circuit. The blade can thus be made to pass through all the intermediate degrees from a white heat at 1500° to a dull red at 600° ; and by means of these graduations the instrument can be made to fulfill three different surgical indications—(1) at 1500° it divides the tissues, producing hæmorrhage; (2) at 600° hæmostasis is produced at the same time as the incision; (3) and between these two limits it divides and cauterizes simultaneously. It is, moreover, in its mechanism an ingenious improvement upon the galvano-caustic knife already in use. M. Demarquay observed that he has once had occasion to employ the instrument, and he became alarmed at the extreme facility with which this knife, without a cutting edge, cuts through the tissues; and if care be not taken much more of these may become divided than is intended. He thinks surgeons should have their attention drawn to the excessive and truly fearful cutting powers of this knife. M. Broca could really see nothing alarming in the powers of the knife; but that may be from his temperament being different to that of M. Demarquay.”—(*Med. Times and Gaz.*)

Stomatoscope.—Among other novelties noticed in the *Med. Times and Gaz.*, is “a new instrument, to be termed the *stomatoscope*, exhibited last week to the Paris Surgical Society by its inventor, Professor Burns, of Breslau. A platinum spiral wire (inclosed in a box-wood cup, to prevent the transmission of heat), brought to a red heat by the passage of an electric current from two of Middeldorps’ elements, is placed in the mouth behind the teeth. The light reflected by a very small mirror is sufficiently intense to render the jaw transparent, so as to allow of the vessels proceeding to the roots of the teeth, the smallest specks of caries, etc. becoming visible. By reason of the transparency, even the labial coronary artery may in some subjects be seen at the level of the commissure, and its course followed. The instrument is therefore likely to form a useful means of exploration in dental affections.”

Syphilitic Deformity of Teeth.—In a review of DR. BUMSTEAD’S work on venereal diseases (*Lancet*), it is stated “that the author confirms, by personal observation, the frequent occurrence of deformity of the teeth connected with interstitial keratitis, first pointed out by Mr. Hutchinson.”

Paralysis with Dementia.—“‘The subject of it,’ says MR. SOLLY, ‘is a man who was once as strong and as healthy as any of you are; but his business was an exciting one, requiring great energy, and tasking the brain to its utmost. In order to supply, and, as he believed, by necessity, the waste which his mental and bodily work created, he used to take a large quantity of wine, thus adding fuel to the fire which was kindled within him. I do not mean that he was intemperate in a worldly sense,

for a man may take a great deal more of stimulants than is beneficial to his organization without exhibiting any signs of injury at the time; but of this be certain, that if you want to keep your brains in a state of healthful mental activity you will take very little. The country gentleman and farmer of the old school might drink their wine, their brandy, and their beer with comparative impunity; for their brains were dormant, and their stimulants were the only stimulus their brains received. But woe to the man of intellect, the man who has to live by the toil of his brain, if he attempts to supply by fermented liquors the loss occasioned by mental labor! He may feel better for a time, but he is sure to sink more rapidly in the end. There was another habit also in which my patient indulged, and which I cannot but regard as the curse of the present age. I mean smoking. Now, don't be frightened, my young friends: I am not going to give a sermon against smoking—that is not my business; but it is my business to point out to you all the various and insidious causes of general paralysis, and smoking is one of them. I know of no *single* vice which does as much harm as smoking. It is a snare and a delusion. It soothes the excited nervous system at the time, to render it more irritable and more feeble ultimately. It is like opium in that respect; and if you want to know all the wretchedness which this drug can produce, you should read the “Confessions of an Opium-Eater.” I can always distinguish by his complexion a man who smokes much; and the appearance which the fauces present is an unerring guide to the habits of such a man. I believe that cases of general paralysis are more frequent in England than they used to be, and I suspect that smoking tobacco is one of the causes of that increase.”—(*Lancet*.)

“*Action of Iron on the Teeth.*—DR. JOHN SMITH has contributed to the last number of the *British Journal of Dental Science* some careful observations on the Action of Medicinal Preparations on the Teeth. His experiments were made by steeping human teeth in solutions of eight preparations of iron, in solution of sulphate of quinine (gr. v, to sulph. acid gtt. i, water \bar{z} ss), dilute phosphoric acid, and Condyl's fluid. After steeping for twenty-four hours the teeth were found unaltered in solutions of the carbonate and saccharine carbonate of iron, the phosphate of iron, the iodide of iron, the citrate of quinine and iron, and in that of the sulphate of quinine. Changes had taken place in the solutions of vinum ferri, the muriate of iron, and the phosphoric acid, showing that these preparations had exerted chemical influence on the teeth. Ten days' steeping in vinum ferri, sulphate of iron, muriate of iron, phosphoric acid, and Condyl's fluid, produced marked changes in the teeth. Precipitates were formed in the solutions, and the substance of the teeth was softened. From these experiments it would appear that the injurious effect of iron on the teeth depends on the mineral acid with which the metal is combined. Dr. Brown concludes that certain preparations of iron, when directly applied, do exercise a powerful effect on the substance of the teeth. And the ratio of the effects obtained would seem to prove that of all the preparations employed in these experiments that of the tincture of the muriate of iron acts most powerfully, the sulphate of iron next, and next to that again, although in comparison very immaterially, the vinum ferri—the other preparations of iron appearing to be inert.”—(*Med. Times and Gaz.*)

"Chlorine in Stinking Breath.—DR. CLEMENS states that during the last thirty years he has constantly found the administration of numerous small doses of weak chlorine water a certain remedy for this distressing inconvenience."—(*Wurzburg Med. Zeit.* and *Med. Times and Gaz.*)

Disinfectant.—In his report to the Franklin Institute (*F. I. Jour.*) PROF. MORTON calls attention to the fact that "if a few fragments of chlorate of potash are thrown into dilute hydrochloric acid, small quantities of chlorine, mingled with hypochlorous acid, are evolved, which act as deodorizer or disinfectant."

Teeth of Fish.—The following interesting remarks on this subject occur in a review of Prof. Owen's work "on the Anatomy of the Vertebrates," in the *Intellectual Observer* for February: "The teeth of the cold-blooded vertebrata are elaborately illustrated by Prof. Owen, and a great many of them in section afford splendid microscopic objects. One class of extinct fishes, the *Dendrodont*, or 'tree-toothed,' are remarkable for the beautiful convolutions of structure which their sections present. The fish world exhibit teeth of a variety of shapes, the conical being the predominant. 'As to number, they range from zero to countless quantities.' Sometimes their teeth are slender, sharp-pointed, and so numerous and closely aggregated, 'as to resemble the plush or pile of velvet'—all the teeth of the perch are of this kind; they are called 'villiform.' When equally fine and numerous, but longer, they are named 'ciliiform;' and rather stronger, are 'setiform,' bristle-like. The pike presents specimens of rasping teeth; and in the pharyngeal bones of the wrasse—a common aquarium fish—"hemispherical teeth are so numerous, and spread over so broad a surface, as to resemble a pavement." All these matters may be easily verified by our readers; and microscopic preparations of fish teeth, of various sorts, would form a very interesting collection."

"On a New Generic Type of Sharks. By THEODORE GILL.—In the year 1858 the Smithsonian Institution received, from Capt. Stone, the jaws and vertebræ of an enormous species of shark existing in the Gulf of California, and known to the inhabitants of the neighboring regions as the 'Tiburón ballenas,' or 'whale shark.' The specimen represented by the spoils was said to have been 'twenty feet long,' with a 'head six feet wide,' 'pectorals three feet long,' and 'flukes six feet between tips.' 'The back from the head to first dorsal fin, brown with reddish spots.' The head is represented as truncated in front.

"The dried dentigerous band of the upper jaw is slightly curved forward, about nineteen inches between the extremities, and somewhat more than an inch in width in front. The teeth are fixed and extremely minute, the largest being little more than a *line* in length, and decrease toward the ends of the jaw; they are disposed in regularly transverse rows, of which there are over one hundred and sixty (164–167) on each side, while in front there are from thirteen to sixteen in each transverse row; each tooth is recurved backward and acutely pointed, swollen and with a heel-like projection in front rising from its base.

"This type will be seen, therefore, to be very distinct, but is evidently

related to the South African genus *Rhinodon*, and must be referred to the family of Rhinodontidæ with the name of *Micristodus punctatus*."—(Ext. from Proc. Acad. Nat. Sciences of Phila.)

Magnesia for Moulding.—"The researches of M. SAINTE-CLAIRE DEVILLE regarding the hydrate of magnesia have led to the production of a very beautiful and useful substance, which has all the good qualities of marble, and, in addition, may be cast in moulds so as to form busts, etc., like ordinary plaster. The hydrate is obtained by calcining the chloride or nitrate at a red heat, and sets very soon on the addition of water without losing its good qualities. It may be mixed with pounded marble, for the purpose of giving it a peculiar grain and color. Kept for some months in a stream of water, it becomes so hard as to be capable of scratching marble; it assumes the crystalline form, and a thin plate of it possesses the transparency of alabaster. Dolomite, and some other combinations of magnesia, when calcined in the same way, afford an excellent cement, which sets under water, and becomes exceedingly hard and tenacious. The temperature during calcination must not, however, exceed from 300° to 400° Cent., which is below redness, or caustic lime will be set free, and the product will be of little or no value; if it has been raised to a white heat, it will not set at all. It is indispensable to the goodness of the artificial marble, or cement, that any lime associated with the hydrate of magnesia should be in the form of carbonate. The value of any magnesian compound, as a source of artificial marble or hydraulic cement, depends on the proportion of magnesia contained in it. Rocks having 61 per cent. carbonate of magnesia answer well for cement, those having 55 per cent. for hydraulic lime, while those having 16 per cent. will still be suitable for stucco."—(*Intellectual Observer*.)

Transmutation of Metals.—M. FRANZ, a metallurgist, and M. HENRI FAURE, editor of the *France Médicale*, have just announced to the learned world that they have discovered a method for transmuting silver, copper, and mercury into gold, 'which,' they say, 'are only one and the same metal in different dynamic states'!!!—(*Chem. News*.)

BIBLIOGRAPHICAL.

The Medical Reporter: A Semi-Monthly Record of Medicine and Surgery. Edited by J. S. B. ALLEYNE, M.D., and O. F. POTTER, M.D., St. Louis, Mo. Three dollars per annum in advance.

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THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, MAY, 1866.

No. 10.

ORIGINAL COMMUNICATIONS.

MICROSCOPY OF THE DENTAL TISSUES.*

BY J. H. M'QUILLEN, D.D.S.,

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An Address delivered before the Connecticut State Dental Association, October 4th, 1865.

(Continued from page 455.)

Up to within the past few years the dentinal tubuli have been invariably regarded by histologists as conduits for conveying to the *tubular* and *inter-tubular* tissues materials inservient to repair the constant molecular disintegration or waste which takes place in dentine as in all other living organic structures. Of late, however, MR. TOMES has discovered under the microscope a number of FIBRILS projecting from the dentinal tubuli, which he is disposed to regard as continuations of the nerve fibres of the dental pulp, and in confirmation of this discovery, DR. LIONEL S. BEALE, in his work on "THE STRUCTURE OF THE SIMPLE TISSUES," says that he has been able to verify this statement, and, furthermore, that they are not "conduits for nutrient fluids which transude through the walls of the vessels, and are supposed to pass along the tubes to the outer part of the tooth." Last evening, among other microscopical specimens, I showed you a section of dentine presented to me by DR. ALLPORT, of Chicago, in which these *fibrils* were readily seen projecting from the dentinal tubuli. Now it is a matter of question with me, whether the fibrils exist as "a soft, solid substance" in the *living* tooth, or are formed *after* its extraction.

You are well aware that when blood is drawn from an artery or vein into a basin, or any other vessel, it *coagulates* or separates into two portions, the *crassamentum* or *clot*, and the *serum* or watery part. I think it is

* In the illustrations accompanying this address, from TOMES, LEIDY, and KÖLLIKER, the plan in GRAY'S ANATOMY, of placing the names of different parts on or near them, has been adopted, in place of the usual numbers and foot-notes.

reasonable to infer that the presence of these fibrils in a microscopical section of a recent tooth is due to the *coagulation* of the organic elements present in the liquor sanguinis circulating in the dentinal tubuli.

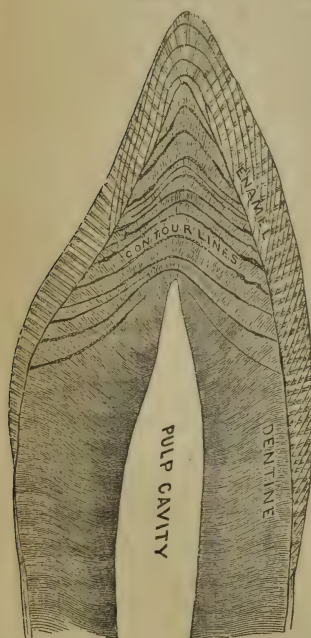
In a series of lectures on the "ANATOMY OF THE ELEMENTARY TISSUES OF MAN," delivered since the publication of the work referred to, DR. BEALE asserts that "there is no evidence of addition and removal of material going on in the enamel and dentine after the completion of their formation, and it is probable that the matter upon which the hardness of these tissues depends is not removed at all after its deposition." Notwithstanding this decided assertion, with the exception of enamel after it is fully formed, and the consolidated dentine of very old persons, the universally received opinion that there is a constant change taking place in *all* the tissues during the life of a being, is beyond a question of doubt correct. It is only necessary to refer to the absorption of the roots of the deciduous teeth (a retrograde metamorphosis by which the dentine and cementum are removed cell by cell, as in their original construction they were formed cell by cell), to disprove the assertion of DR. BEALE. The evidence of molecular change in the dentine and cementum is by no means, however, confined to the deciduous teeth; for frequent and well-marked instances are brought to the notice of the dental practitioner in

which teeth, originally soft in their structure and cutting readily under the instrument, become, in course of time, hard and compact, while on the other hand, teeth which are quite hard become very soft and chalky. That this change of structure is due to constitutional influences, and is brought about by molecular change in the part affected, is more than a reasonable supposition, for it bears upon its face an air of positive certainty.

Much more might be said in confirmation of this, but I refrain from doing so at this time, and now direct your attention to what are called the **CONTOUR LINES** of OWEN. You will observe them in this drawing, running in an arched manner, somewhat parallel to each other, and nearly at right angles with the dentinal tubuli, in that portion of the dentine which constitutes the greater part of the crown of the tooth; although

thus represented in this instance, they are by no means confined to this part

FIG. 4.



of the tooth, but may be found in the dentine of the root. The appearance of these markings, arched or contour lines, is attributable to the *primary curvatures* of the dentinal tubuli and the formation of the dentine in striæ or laminae, as with the rings observable in the trunk of a tree. These markings are not always presented in a decided manner in human dentine, but they constitute quite a marked and frequently beautiful feature in the teeth of some of the lower animals. In addition to the peculiarities just referred to, which are in every sense a normal condition, certain cavities or spaces, to which the term INTER-GLOBULAR SPACES has been applied, are also observable. These

spaces, which are most numerous in the vicinity of the enamel, although they occur in other portions of the dentine, are said by KÖLLIKER not to be filled with fluid during life, but by a "soft substance, resembling tooth cartilage." This dries up in microscopical sections, and cavities are formed,

which give the appearance denominated inter-globular spaces. Although this cannot always be regarded as an abnormal condition, still in defective teeth these cavities are larger and much more numerous than in perfect teeth.

INTER-TUBULAR TISSUE.—This was spoken of in the preceding part of the address as a connective matrix between the dentinal tubuli. It contains the greater part of the earthy constituents of dentine, and under a high power of the microscope presents a granular appearance. The formation of the contour markings and the inter-globular spaces of course involves the inter-tubular tissue as well as the dentinal tubuli.

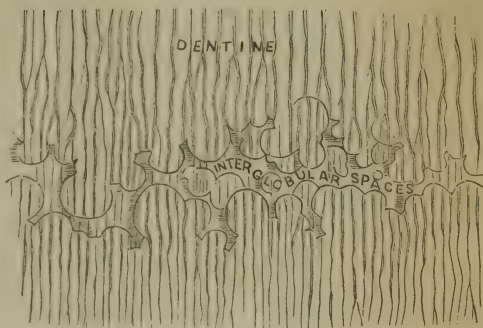
According to VON BIBRA, the chemical proportions of dentine in man are—

Organic Substance, 28.01.

Inorganic Substance, 71.99.

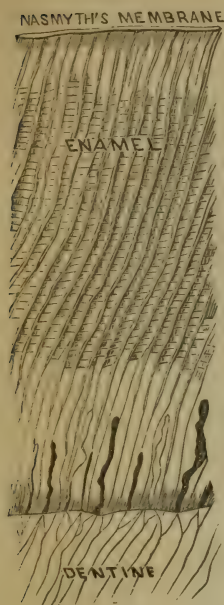
ENAMEL.—This substance, which is the hardest of all organic structures, covers and protects the dentine to the neck of the tooth, being thicker at the grinding surface, and gradually tapering to a thin edge at the neck. A calcified structural substance, called NASMYTH'S MEMBRANE, is found covering the enamel for a short time after the eruption of a tooth, but is eventually worn away. The enamel is translucent rather than white, and although extremely hard is frequently worn away by protracted use. It is composed of solid hexagonal fibres or prisms, about $\frac{1}{5500}$ of an inch in

FIG. 5.



diameter, arranged in close proximity to each other, and fitting at their inner extremities into hexagonal depressions upon the coronal surface of the dentine. As you observe in this drawing, the fibres marked at short

FIG. 6.



intervals by dark transverse lines, run in a gently waving manner parallel to each other. They are nearly vertical when passing toward the grinding surface of the tooth, and horizontal on the sides. To compensate for the increased extent of surface at the periphery of the enamel, the diameter of the outer ends of the fibres is somewhat larger than the inner, and still further to secure a perfect structure, short enamel fibres are interposed in what would otherwise be vacant spaces. In young teeth, TOMES states that canals exist in the enamel prisms. In addition to this, fissures frequently occur in the enamel, particularly in the depressions or crevices between the cusps of the bicuspid and molars, and extend down to the dentine. When existing, these fissures constitute a decided predisposing cause of decay in the teeth. The dentinal canals sometimes extend into the enamel, and terminate in somewhat expanded cavities.

Concentric ridges or furrows may be readily distinguished, and frequently even without the aid of a magnifying glass, upon the external surface of the enamel, particularly in deciduous teeth. Their presence is to be accounted for on the same principle as the contour lines of dentine.

When subjected to the action of dilute acids, the enamel is almost entirely dissolved, and scarcely a trace of animal matter is discernible. According to VON BIBRA, the chemical composition of enamel is—

Organic Substances, 3·5.

Inorganic Substances, 96·5.

CEMENTUM.—This substance, which invests the roots of human teeth from the termination of the enamel to the apex of the root, where it is usually very thick, approximates to bone, not only in microscopical structure, but also in chemical composition. The *Haversian* canals, peculiar to bone, are rarely seen in cementum, except in hypertrophied conditions of the structure, but LACUNÆ and CANALICULI are always present (though sparingly), and well marked, as in the drawing (see Fig. 3, page 455), and resemble in every particular the lacunæ and canaliculi of bone. They are placed lengthwise around the fang, those in proximity to the dentine joining with the terminal branches of the dentinal tubuli, while those upon the external surface radiate toward the periodontal membrane.

By this arrangement, even after the extirpation of the dental pulp, the vitality not only of the cementum but also of the dentine of the root is maintained. As age advances, or from exciting causes in adult life, the cementum frequently becomes hypertrophied, and constitutes what is called *exostosis* of the roots. The chemical composition of human *cementum*, according to VON BIBRA, is—

Organic Substances, 29·42.

Inorganic Substances, 70·58.

OSTEO-DENTINE of OWEN, or the SECONDARY DENTINE of TOMES.—This structure is frequently found in the pulp cavities of human teeth, either coalescing with the previously formed dentine, or as separate and distinct nodules; and in some instances the pulp cavity is occupied by an entirely calcified pulp, which has no connection with the walls of the cavity, and with proper management can be removed entire from its position. Under the microscope, this substance presents the *lacunæ* and *canaliculi* of bone and cementum, and in some rare instances the *Haversian canals* are also observable.

The different microscopical structures which have engaged our attention as presented in the human teeth are arranged upon a different plan in many of the lower animals. We have found, for instance, in making a *vertical* section of a human tooth, that the dentine of the crown is covered entirely by enamel, while that of the root is invested by the cementum, and this is true of the *Quadrumana*, and nearly all the *Carnivora*; but in the *Herbivora*, the *Pachydermata*, *Ruminantia*, *Rodentia*, etc., on making a *transverse* section of the crown of their teeth, the enamel, cementum, and dentine are found upon the same plane. By this arrangement an admirable provision is made for the thorough comminution of the food upon which such animals subsist. Consisting as it does of grass, hay, or grain, considerable trituration or grinding is necessary, and owing to the presence of large quantities of silica, which is extremely hard, the teeth wear away rapidly, and on account of the different degrees of density of the various tissues, do so in an unequal manner; the cementum being the softest, wears most rapidly, the dentine next, and enamel the slowest of all. In this way an uneven and roughened exterior is presented by the masticating surface of the molars, like that in the opposing surfaces of the upper and nether stones in a grist-mill.

Much more could be said in connection with this interesting subject, for it has only been touched upon by me in the most general and elementary manner, but I will not trespass further upon your patience, as a considerable portion of your time has already been occupied.

THE TUMORS OF THE MOUTH.

BY JAS. E. GABRETSON, M.D.

(Continued from p. 460.)

Osteo-Sarcomatous Tumor.—The myeloid tumors of Mr. Paget seem to me justly classable with the osteo-sarcomatous, inasmuch as they so closely resemble fibro-plastic structures as to lead to the inference that such portions as seem marrow-like, are rather the result of retrograde metamorphosis—a metamorphosis into the medullary type of carcinoma—than of original pathological development. It was on account of their being made up of the fibro-cell that M. Lebert gave such growths the original name “fibro-plastic.”

I do not, however, presume to dispute pathology with Mr. Paget; so far as the purpose of our present classification is concerned I have only to do with the fleshy appearance of these tumors. Minutely they may have been made up of marrow-like substances, but if in general appearance they are fibrous or flesh-like, then they belong to the class osteo-sarcomatous, when found associated with bony tissue.

A myeloid, says Mr. Paget, like a fibrous tumor, may be either inclosed in a bone whose walls are expanded round it, or, more rarely, it is closely set on the surface of a bone, confused with its periosteum. The sketches of fibrous tumors pictured in his *Surgical Pathology*, page 105, might, he says, be repeated for myeloid tumors.

Mr. Paget sets down these two kinds of tumors as being equally common to the jaws, both the superior and inferior.

When, he says, the myeloid is inclosed in bone, the tumors usually tend to the ovoid or spherical shape, and are well defined, if not invested with distinct thin capsules; seated on bone, they are (as exemplified by the Epulic structures) much less defined, less regular in shape, and often deeply lobed. They feel like uniformly compact masses, but are in different instances variously consistent. The most characteristic examples are firm, and (if by the name we may imply such a character as that of the muscular substance of a mammalian heart) they may be called fleshy. Others, he says, are softer, in several gradations, to the softness of size gelatine, or to that of a section of granulations. Even the firmer are brittle, easily crushed or broken, they are not tough, nor very elastic, like the fibro-cellular or fibrous tumors, neither are they grumous or pulpy, neither do they show a fibrous or granular structure on their cut or broken surfaces.

Mr. Paget describes sections of these tumors as appearing smooth, uniform, compact, shining, succulent, with a yellowish, not a creamy fluid. A peculiar appearance, he says, is given commonly to them, by the cut surface presenting blotches of dark or livid crimson, or of a brownish or

a brighter blood color, or of a pale pink, or of all these tints mingled on the grayish-white or greenish basis color. (In a foot-note, Mr. Paget quotes from Lebert, who says the greenish-yellow color that may show depends on a peculiar fat sort of xanthose.) The tumors, he says again, may all be pale, or have only few points of ruddy blotching, or the cut surface may be nearly all suffused, or even the whole substance may have a dull modena or crimson tinge, like the ruddy color of a heart, or that of the parenchyma of a spleen. Mr. Paget believes that many of what have been named spleen-like tumors of the jaws have been of this kind. The color they present, he says, is not due merely to blood in them; some of it is appropriate to their texture, as is that of the spleen or that of granulations, and it may be quickly and completely bleached with alcohol.

The following are the microscopic appearances which Mr. Paget says are peculiar to the myeloid growth, being imitated in no other morbid structure.

1. Cells of oval, lanceolate or angular shape, or elongated and attenuated like fibre cells, or caudate cells, having dimly dotted contents, with single nuclei and nucleoli.

2. Free nuclei, such as may have escaped from the cells, and among these, some that appear enlarged and elliptical, or variously angular, or are elongated toward the same shapes as the lanceolate and caudate cells, and seem as if they were assuming the character of cells.

3. The most peculiar form; large, round, oval, or flask shaped, or irregular cells or cell-like masses, or thin disks of clear or dimly granular substance, measuring from one three-hundredths to one-thousandth of an inch in diameter, and containing two to ten, or more, oval, clear, and nucleolated nuclei.*

Corpuscles, such as these, irregularly and in diverse proportions, imbedded in a dimly granular substance, make up the mass of a myeloid tumor. They may be mingled with molecular matter, or the mass they compose may be traversed with filaments or with bundles of fibro-cellular tissue and blood-vessels, but their essential features (and especially those of the many-nucleolated corpuscles) are rarely observed.

Many varieties of aspect (as remarked by Mr. Paget) may thus be observed in myeloid tumors, and beyond these they may even be so changed that the microscope may be essential to their diagnosis. After they partially ossify, well formed cancellous bone being developed in them, cysts, also filled with bloody or serous fluids, may be formed in them, occupying much of their volume, or even almost excluding the solid texture.

Mr. Paget says he lately amputated the leg of a woman, twenty-four years old, for what was supposed to be a cancerous tumor growing within

* These microscopic elements, as referred to in the paper on Epulis, are presented on page 449 of "The Surgical Pathology."

the head of the tibia. She had pain in the part for eighteen months, and increasing swelling for ten months, and it was plain that the bone was expanded and wasted around some soft growth within.

On section, after removal, the head of the tibia, including its articular face, appeared expanded into a rounded cyst or sac, about three and a half inches in diameter, the walls of which were formed by this flexible bone and periosteum, and by the articular cartilages above; within there was little more than a few bands or columns of bone, among a disorderly collection of cysts filled with blood, or blood-colored serous fluids. The walls of most of the cysts were thin and pellucid; those of others were thicker, soft, and brownish yellow, like the substance of some medullary cancers, a likeness to which was yet more marked in a small solid portion of tumor, which, though very firm, and looking fibrous, was pure white and brain like.

None, Mr. Paget says, who examined this disease with the naked eye alone, felt any doubt that it was an example of medullary cancer, with cysts abundantly formed in it. But on minute investigation, none but the elements of the myeloid tumors could be found in it; these, copiously imbedded in a dimly granular substance, appeared to form the substance of the cyst walls, and of whatever solid material existed between them. The white brain-like mass was apparently composed of similar elements in an advanced fatty degeneration, but neither in it, nor in any other part, could I find a semblance of cancer-cell.

Mr. Paget fails to inform us as to a return of the disease; it does seem to me that in the present state of our knowledge of cancer growths, it would have been a very difficult matter to have classed such a tumor with the non-malignant. It certainly was very heteroclitic in character, and whatever we individually may feel disposed to think of such a structure, it serves to exhibit the merging of the benign into the malignant, and their relationship. A consideration of such cases as this should serve to keep the practitioner on his guard, preventing his being too confident in any prognosis he may give to a patient.

An epitome of the myeloid may thus be presented:

They are a class of fleshy tumors called by M. Lebert fibro-plastic, because, he says, they are made up of fibre cells. They are called myeloid by Mr. Paget, because he thinks they much more resemble marrow than fibrous tissue.*

In character, according even to Mr. Paget, they vary from simple semi-fibrous, semi-marrow-looking structures to those so heteroclitic that they seem to merge into the medullary.

Their favorite seat seems to be about the bones, either intra or extra,

* Mr. Paget does not call all fibro-plastic tumors myeloid; he only says a myeloid is different from the ordinary fibro-plastic of Lebert.

being, perhaps, more common to the maxillæ than the other osseous structures.

They are growths which usually occur singly, they are more frequent in youth, and very rare after middle age; they generally grow slowly and without pain, and usually commence without any known cause, such as injury or hereditary disposition.

According to Mr. Paget, they rarely, except in portions, become osseous; they have no proneness to ulcerate or protrude; they seem to bear even considerable injury without becoming exuberant; they may shrink or cease to grow; they are not apt to recur after complete removal, nor have they in general any features of malignant disease.

Since writing the above I have accidentally fallen upon a classification of the tumors of the upper jaw, made by Mr. Hancock. After alluding to various classes, he says: "In addition to these, Mr. Paget adds what he terms myeloid tumors of the part; but while the examples he quotes resemble on the one hand so much the fibrous, on the other the medullary tumors, their true character, whether innocent or malignant, is so very doubtful that I should hesitate in admitting them as a distinct class."

I am pleased to quote this from Mr. Hancock: he speaks my mind on the matter. There are already quite enough subdivisions in our science without counting in such as can be done very well without. Indeed, it is because I so prefer a general, tangible, rather than a hair-splitting classification, that I am disposed to stick to the embracing term of sarcoma. I understand pretty well what a man means when he tells me of an osteo-sarcomatous form of growth; he has only further to tell me whether it was benign, disposed to malignancy, or already malignant, and I understand exactly what he means.

Fibrous tumors proper, the fibroid and the fibro-plastic, have general features in common; that is, they belong to the class of sarcomatous growth; but then, in a pathological sense, they have such differences that an epitome, at least, of their history should be reviewed by us.

In some instances, fibrous tumors are seen under the microscope to have a concentric development; this species is slowest of growth, is most benign, and never attains any great size.

In another species the fibres interlace in a most complicated and irregular manner. This kind attains the largest size, and seems striding toward the heteroclite.

A third class consists of an aggregate of nodules, and is compared by Dr. Humphrey to a conglomerate gland; the tumor, he says, is made up of small masses closely compressed together, having an uneven, knotty outline.

(To be continued.)

GASTRIC ACIDS—THEIR DELETERIOUS INFLUENCE ON THE TEETH.

Read before the New York Society of Dental Surgeons, January 17th, 1866.

BY A. C. CASTLE, M.D.

CHEMICALLY good food, it is argued by dental physiologists, offers all the elements necessary for elaborating "pure blood." Pure blood supplies all the material to construct perfect tissues. Perfect tissues constitute the perfect organization of the being—the teeth, of course, included; and there now remains nothing more to complete this state of perfection of the favored one than to migrate to a more favored hemisphere where people do not die. The *physiologist* knows that pure blood is a natural impossibility. While physiological functions may select the purest particles for the animal structure on the one hand, it is as well known that by the circulating medium of the blood, the organic system offers the *common sewerage* of the animal economy. How perfect teeth may be secured to newly organized beings in uterine transitu, by feeding the maternal system with chemically good food, is now happily elucidated by the research of medical-dental physiologists. All that remains to be done is to *regenerate man*. I ask your attention to the child from its birth to about the eighth year: during this period gastric acids are generated in excess, which all the catch-penny "soothing syrups" and all the carminatives prescribed cannot remove; on the contrary, the *soothing syrups*, the basis of which is opium, are only *intensified* in their poisonous effects by the gastric acids.

If we reflect, we may account for this excess of acidity upon the basis of the vital functions of the whole animal economy being excited by a persistent and extraordinary condition of activity and mobility. The animal system at the earlier periods of life requires a bountiful supply of phosphates, the chief constituent of the animal tissues. Hence children are always hungry and would be always eating. Chemical analysis demonstrates the maternal milk almost identical with the blood, abounding with the phosphates. Indeed, with correctness, it might be asserted that the difference between milk and blood is in color—the one is white and the other red. Notwithstanding the milk presents the interesting characteristic of ready prepared nutrition, as soon as it is deposited within the stomach of the infant we find that the gastric acid changes its entire character to promote the assimilation of its phosphates, etc. with the child's blood, for the rapid development of its organization. In the process of this chemical animalization of the chlorurets of sodium, calcium, etc., large quantities of gas or *flatus* are set free, which is

constantly eructated, or passed with curded milk and acrid acid fluids. During the period of infancy we observe these gastric acids in excess, not only in our own species, but also in the lower grade of animals. As infantile life progresses in developing the growth, the strength, and the perfecting of the tissues of the body, the action of the acids with the phosphates, etc. is more uniform, and the animal chemistry acts in harmony with nature's intention. Hence, as the normal metamorphosis of atoms in the animal economy diminishes the formation of gastric acids, so stomachaches, gripings, spasmodic twitchings, convulsions, spasms, sardonic grins, startings, and the uprolling of the eyeballs, etc. are more remote from each other, until they cease altogether, relieving advanced infancy from gastric and sympathetic cerebral irritations.

It is difficult, nay, impossible, to propose lines of demarkation in the laws of organization and the concomitant nervous sympathies. The functions in the organization of the teeth, implicating as they do the fifth pair of nerves and the sympathetic ganglia, no doubt present a great, if not the chief cause producing the distressing symptoms affecting and afflicting *the period of dentition*. At the same time the most ordinary observation will be ample to satisfy our minds that gastric acids materially assist in intensifying the nervous irritability of the infantile system. Without a knowledge of the *cause*, every mother observes the effects in acidified or scalding urine, excoriating the infant's flesh, and acrid acidified discharges from the bowels, irritating and inflaming the natural outlet of the body.

The excess of acid in the infantile state is negatively demonstrated by the absence of "tartar" from children's teeth under ten years of age. In place of *salivary calculus*, we find an *acrid dark-green acidified slime* collected upon, corroding and eating into the surfaces and necks of the teeth, causing tenderness, with irritative fever, teethache, earache, and neuralgic symptoms, where the branches of the fifth pair of nerves extend into the scalp. This acidified green slimy deposit, securing a hold upon the permanent teeth—making their eruption through the gums—too often furnishes the foundation for very many dental troubles, vexing maturity and after-life.

The next acid diathesis, to which I would call your attention, we find demonstrated in consumptive patients. Nutrition being inharmonious, gastric phosphoric acid is set free; the bones and softer tissues forming a delicate structure of the whole system. Like the deciduous teeth of infantile organization, the teeth of consumptive or strumous habits of body are little better than solidified ossified gelatine, presenting closely the same physical characteristics; and, like the infantile teeth, are eaten into by the green acidified slime. These gelatinous teeth of phthisical or strumous diathesis are corroded and eaten into by gastric phosphoric acid with the same distressing symptoms affecting and at-

tending dentition, with fever and neuralgic paroxysms. In complicated cases of disease, several acids are eliminated from the stomach, the mucous membrane of the bronchiæ, throat, and the mouth. In these we observe a heterogeneous mixture of opposing chemical elements, acting and reacting upon each other. In such cases, we find a mixed, filthy mucous, slimy, sandy, animal compost, forming a soft, greasy "tartar," covered with saliva, and saturated with pus: the mass of matter presenting a fit type of the condition of the system.

The next gastric acid diathesis, to which I now ask your attention, exists during the period of *gestation* and *lactation*. An enormous quantity of blood, as you know, is conveyed to the matrix, carrying the phosphates and other material of nutrition taken in the food by the mother, and, in addition to which, even the substance—phosphates if you please—of the maternal system is often drawn upon for the organization of the *foetus*. This drain upon the maternal economy sets free the gastric acid in large excess during the period of pregnancy and nursing. Hence the concomitant sympathies, "morning sickness," "heartburn," "depraved appetite," etc. Hence the affinity of peculiar gastric acid with the lime of the teeth; and others affecting the necks of the teeth only; the former decomposing, and the latter rendering them tender and odontalgic with remote neuralgic sympathetic pains. Hence little salivary calculus is deposited on the teeth under these circumstances. Hence we find the existence of the same order of action in the economy during the period of nursing. Nutrition, now, is directed from the matrix to the mammary glands for the formation and secretion of milk. In many instances the milk is deficient in phosphates, but holding lactic acid in excess. Hence the mother is said to have "bad milk:" the infant receives no nutrition and sinks under *marasmus*. *Mental*, as well as the non-chemical animalization of the milk produce the same results. *Lactic acid* acts upon the liver and produces those *green discharges* from the bowels, the acrid urine, and many symptoms attributed to "teething," of which children too often die.

Peculiar acid diatheses are present in "dyspeptic" derangements. At different periods of this affection, several distinct acids are generated, interfering with the functions of digestion; sympathizing with the stomach, the mucous membrane of the mouth also eliminates its acids—all combining to destroy the dental organs. The first distressing symptoms affecting the sufferer are the acute pains on the line of the necks of the teeth, and along the ridges of the dento-maxillary gums and *alveoli*, by the contact of cake, confectionery, sugar, molasses, etc.

The gastric acid eliminations of dyspeptic stomachs whose functions are occasionally or periodically affected with "fits" of indigestion vary according to the different constitutions, habits, and temperaments of individuals.

The principal acids evolved from the digestive organs of the differently influenced constitutions and temperaments, severally, are phosphoric, lactic, oxalic, sulphuric, chloric, and (sometimes) acetic acids—which with carbonic acid gas, and sulphuretted hydrogen gas, evolved from the lungs, all chemically act upon the enamel and bone of the teeth.

In consumptive persons, where disease is in full force, and the lungs more or less destroyed (and even in those whose lungs are affected with congestions of the membranes), chloride of sodium or salt is found in excess in the mucous secretion. Of the action of the gastric acids upon the substance of the teeth every *practical* dentist knows *the effect*—if he do not comprehend or understand *the cause*. The first impression the acids make is seen upon the line of the ridges of the gums, embracing the necks of the teeth, which exhibit either signs of congestion slightly puffed, or flaccid jelly-like everted edges hanging loosely about the teeth. The action of table salt, cakes, sweetmeats, etc. causes acute pain, both in the substance of the teeth, but more acutely on the irritated periosteum exposed upon their necks; the substance of the teeth is gradually softened or decomposed, in many instances the enamel presents its appearance perfectly white, as if calcined by the action of fire, crumbling, and friable (“white decay”), and easily broken down. Other teeth, on the contrary, present a mass of softened bone within the broken enamel, similar in appearance to softened gutta-percha or macerated chamois leather. In some persons, these teeth crumble away without superinducing pain or uneasiness; others, again, suffer all the tortures of neuralgic sympathetic pains in the head, jaws, face, eyes, temples, neck, arms, etc.

Gastric acids play their parts with uniform order upon different localities of the faces of the several described teeth. I have observed *four* general groups of teeth presenting, by the classification I have made, modifications in their connection with, and *significant* of the *physical* ancestral and constitutional diathesis, or peculiar “habit” of body, and the pathological predisposition of each particular individual, viz.:

First.—The large, firm, dense, yellow teeth.

Second.—The dense, yellowish-white teeth.

Third.—The *opaque*, chalky white; the *transparent*, yellow white; and the *opaque*, yellow, *chalky* teeth.

Fourth.—The transparent, glassy, chalk white; the transparent yellow, and the *pearly*, *bluish-white*, *translucent* teeth.

In the *third* and *fourth* groups the dentist frequently meets with deep pits, often in connection with longitudinal furrows or indentations—the teeth being singularly *serrated* on their cutting edges. Sometimes these furrowed indentations, and even the serrated points, present perfect isolated deposits of lime, without animal matter forming a natural chemical constituent. On inquiry, we discover that the possessors of these teeth are the children of strumous or consumptive parentage; and that

in the eruptive cutaneous diseases, measles, scarlet fever, small-pox, etc., during infancy, in some we find an alkaline, while in others an acid diathesis exists during the period of the eruptive disease; hence we find their *marks* made at these periods of the nutritive process upon the disturbed organization of the teeth.

(To be continued.)

THE INJURIOUS RESULTS OF AN EARLY EXTRACTION OF THE PERMANENT TEETH.

BY A. C. HAWES, NEW YORK CITY.

THE mouth is an outlet of the mind, and whether at rest or speaking, contributes more than is generally supposed to reveal character and emotion. Of all the features of the face, it is the one which always exacts the most strict and minute attention. It needs no physiological knowledge to assert, that full and expressive lips, white and regular teeth, healthy gums, and pure breath, are indispensable characteristics of its agreeableness and beauty. Upon the perfect conformation and condition of the different parts belonging to the mouth, particularly the teeth, depend a just and harmonious delivery of words, the pleasing eloquence of the smile, and the many nameless attractions which dwell in the vicinity of this feature. In the act of eating too, as well as its other manifold duties, the *natural* and *unimpaired fullness*, together with the skillful and neat management of the mouth, are very important to personal appearance. It is impossible, therefore, to be too particular in the hygienic and preservative care bestowed upon this portion of the face.

Now when we consider that the mouth and lips are but the curtain of the teeth, deriving their shape and expression almost entirely from them, and losing all their beauty and attraction when the teeth are gone, or when they assume unnatural positions, the removal of a single tooth which may, however remotely, lead the way to such a catastrophe, becomes a matter for grave consideration. The act once performed, though seemingly trifling in itself, may be causing an injury which all the resources of art and science can never repair.

This may at first thought appear to many an exceedingly simple matter, quite unworthy of the attention of our profession; and, indeed, is often perpetrated with a thoughtlessness and disregard of consequences, showing anything but a careful appreciation of the subject. But to my mind, the almost inevitable disfiguration of a beautiful child for life by the act, is a result of too frequent an occurrence, and of too painful a nature, to be lightly passed over. So long as the evil consequences of an erroneous practice could be made chargeable to a defective organiza-

tion, little fear of any blame was to be apprehended. But now that the anatomy and physiology of the human frame are more fully understood, and the fundamental principles of enlightened dental practice are based upon physical science, and tested by a daily observation of facts, the members of our profession should no longer be allowed to screen themselves from the responsibility of such practice: I refer now more particularly to the early removal of teeth for the ostensible purpose of correcting irregularities, or relieving a crowded condition of the mouth, incident to a partial or defective development of the dental arch.

It is truly painful to witness the persistency with which this practice is still adhered to, and as an inevitable consequence to find children with full, fair, and otherwise symmetrical features, deprived of that intelligent expression which nature had imparted to the face. By the extraction of a "bicuspid" or "a six-year molar," the whole character and beauty of the mouth, in all its active and playful motions, may be permanently destroyed; and in the place of the broad, full, and well-rounded arch, thickly studded with precious gems, there will remain but a narrow and contracted deformity, almost wedge-shaped, which the most intelligent skill of the dental profession can never restore. What excuse, let me ask, or what recompense can atone to the parent or to the child for the infliction of a life-long injury such as this?

However much may be said in palliation of such treatment in times gone by, those who still continue the practice should be held responsible for the result. Whenever a crowded condition of the teeth appears during their eruption from the gums, a moment's reflection, it would seem, should be sufficient to convince any intelligent and unprejudiced mind that *extraction* is not the means best calculated to remedy the defect, or even assist in the slightest degree to promote a proper development of the surrounding tissue. While there may be a few extraordinary cases in which parting with a tooth does no harm, as in a naturally large jaw, with an over-full supply of teeth, yet in the vast majority of instances the loss we have alluded to is evidently an unjustifiable interference with nature. It is virtually assuming that the all-wise Creator of the universe made a grand and radical mistake in the organization of the human family, and that consequently it devolves upon the *dental profession* to correct the error, and perfect the "noblest work" of Deity.

The truth is, nature proceeds to her work with consummate wisdom, and does nothing of doubtful utility, but with a full knowledge of remote results. She purposely throws up a number of teeth at once, even if there seem no room for them all at first in regular order, so as to give the jaw a wider expansion and make it accommodate itself to the intended supply and future growth. To remove, therefore, any of the teeth with the view of relieving the jaw, is thwarting nature's own process, and preventing that width and rotundity which are so much needed, and can-

not otherwise be attained. Instead of a proper and desirable enlargement, the jaw remains stationary, the remaining teeth falling into the contracted space, and thus presents a diminutive and unnatural appearance compared with the other features, which go on filling out during the age of puberty. This is the prominent cause of the many narrow and deformed jaws which are so often seen in the higher walks of life,—dental *skill* (?) in these instances having been more usually called in requisition for the children of the wealthy. Indeed it is a fact which is patent to any careful observer, that American ladies are becoming somewhat noted for the extreme narrowness of the lower portion of the face, and consequent loss of a natural and pleasing expression of countenance. The dental profession and the public need to awake to the cause of this deplorable fact,—which is owing to the want of a *full development of the dental arch*; for where a proper development has been attained, it will be *quite impossible* for this state of things to exist. It is from no limited observation or hasty inference that I have been forced to the conclusion that the premature extraction of the permanent teeth, particularly the “six-year molars,” has led in almost every instance to this irreparable mischief. It is undeniable that hundreds of these teeth are annually sacrificed, simply in anticipation of a crowded condition of the mouth; whereas, if only left to itself, nature would provide its own remedy, and present a beautiful and satisfactory result. Most of the irregularities of this kind, with the growth of the jaw would gradually correct themselves; and in the rare exceptions where this might not occur, would it not be better to bring *dental skill* to the support of nature, by aiding her to force the teeth into their proper places, thus preserving what is so valuable and necessary for a lifetime, than to inflict a far worse evil by resorting to extraction? That surgeon would hardly be accounted judicious who, in treating an irregularity of any other organ, as a case of strabismus for instance, should proceed to remove an eye because its angle of vision was more convergent or divergent than the other, instead of adjusting the visual axis of the two alike. It is easy enough to destroy nature, but it is the province of intelligence and skill to preserve it.

There are of course other causes for which the dentist is not so directly responsible, that in some cases occasion a want of development in the structure of the jaws, and a consequent crowding of the teeth into abnormal positions. Many persons have assigned as one of the prominent reasons, the habitual use of food not sufficiently hard to furnish the necessary exercise in its mastication to secure a healthy and vigorous growth; it being an established fact that the use of any part of the system has a direct tendency to supply it with more nutriment, and so develop it. Others profess to believe that the premature extraction of the *temporary teeth* is sufficient to produce a permanent diminutiveness of the jaw. Prof. McQuillen is entitled to the credit of first directing attention to the fact

that the irregularity of the permanent teeth attendant upon the early loss of the deciduous set is not so much due to the *contraction* of the *jaw* as to its *arrested growth* from want of *use*; for in the absence of deciduous molars the usual exercise from mastication is not obtained. These causes, without doubt, have great influence in preventing its requisite future development; but the *more common* and *fatal* injury by far is to be traced to the *extraction*, and at the hands of *intelligent operators*, of *permanent teeth*, before the jaw has attained its normal size and proportions, under the mistaken notion we have considered. The immediate object which is aimed at, it is true, is usually attained,—the greater freedom for the remaining teeth, and the removal of the lateral pressure naturally arising from the diversity of size between the temporary and permanent teeth, the latter being twice the width of the former, whose place they are intended to occupy in the arch,—but at what a lamentable cost to the patient!

The following engraving, Fig. 1, is an illustration of the result of the early loss of the first molars, which in this instance were removed in order to *make room* for the crowded condition of the teeth. As a necessary consequence, the dental arch has been destroyed, and all future growth of the jaw prevented; the teeth having all the space they will *ever* require. Nature intends a certain number of teeth to give the arch its proper size: consequently, where a less number fills the space, a more or less contracted and diminutive appearance *must* be the result.

FIG. 1.



In Fig. 2, we present a case of an overcrowded condition of the mouth, where all the teeth have been preserved, although extraction had been *more than once* urgently advised. By aiding nature, however, to expand the jaw, the teeth were forced into their proper places, and thus the full

proportions of the dental arch permanently secured, as will be seen by Fig. 3.

FIG. 2.

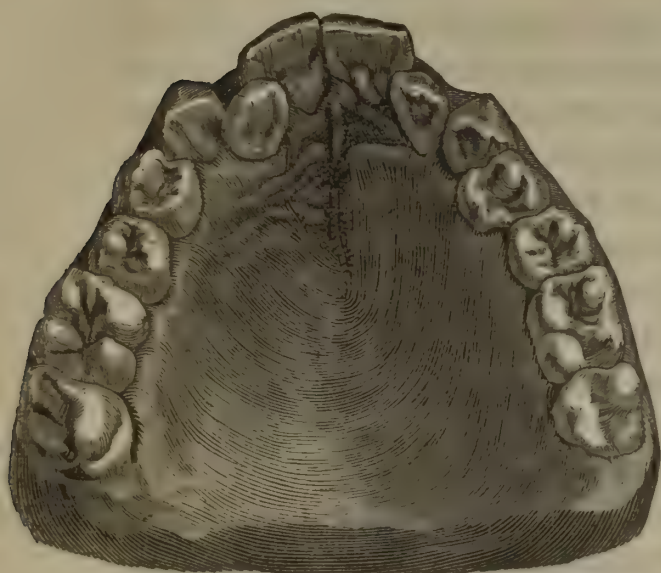
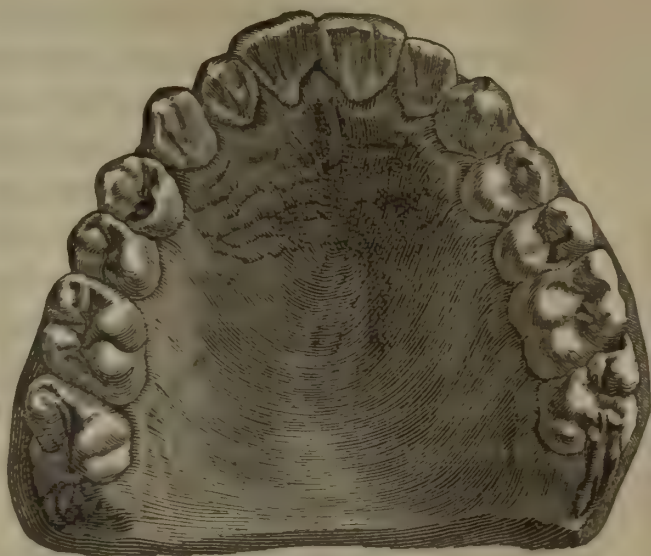


FIG. 3.



These are exact copies of casts taken from the mouths of two young ladies, both about sixteen years of age and of equal size; each requiring, therefore, the same development, in order to give the face its proper symmetry and a pleasing expression. In the former case, it will be evident, this result has been rendered impossible; whereas, in the latter, it has been happily attained.

CLASPS AS FASTENINGS FOR ARTIFICIAL DENTURES.

BY J. W. CLOWES, NEW YORK.

Read before the Brooklyn Dental Association, February 21st, 1866.

Mr. President:—The subject for dissertation this evening is “CLASPS AS FASTENINGS FOR ARTIFICIAL DENTURES.” While I regret that *this* task has been imposed upon *me*, I frankly confess that no *one* item of professional duty has ever received more of my attention. My whole experience confirms me in the belief that where it can be used it is the most reliable of all fastenings. Its sphere of usefulness, confined as it is to partial sets, of course is limited. Like the dental file, the clasp fastening has had a name, which comes to it in like manner by the malfeasance of the hand that manipulates and directs it. To be fully comprehended, I am obliged to discuss the thing to be fastened as well as the fastening. For a well-fitting plate, and clasps judiciously applied, must ever be united to insure success: I use in my practice narrow but *doubled* gold plates, composed of what may be called the *base* and *stiffener*. I employ *two* castings and *two* counters. The base and stiffener are separately struck up, and swedged. They are placed together and swedged again. They are united by solder nearly as fine as the plate,—again swedged, and all this

between the same casting and its counters. *Annealing* should always precede swedging. Having accomplished thus much by the means explained, like a general who intends to win, I now bring forth my *reserved* casting and make the impress of the unchanged form upon my plate. If attaining the result at which I have aimed may be called success, then success has been won. The plate being thus fitted and setting easily and comfortably upon the gums, my attention is next given to the fitting of clasps. There are several important points to be considered in this connection; a good hold is to be gained—damage to the natural teeth is to be avoided, and care in applying, wearing, and rendering the plate as essential to the happiness and well-being of the patient in whose service we labor. A good hold can seldom be gained upon the natural teeth while retaining their original form. The difficulties to be surmounted are mainly found in their rotundity of superficial or lateral swell.

A clasp, well adjusted to the *unchanged* shape, secures a fit and a hold, but not facility of insertion, removal, and immunity from harm. If the clasps surrounding the teeth merely touch the centre of protuberance, the hold is slight and unstable, while their liability to injury is greatly increased by their capacity for retention of extraneous deposits. Having thus premised, you are prepared to understand the necessity for *plain surfaces* in the appropriate adjustment of clasps. The *approximal* sides of all teeth which I intend to clasp are *flattened by the file*, not roughly and wastefully, but carefully and skillfully done—done with a conscientious regard for professional integrity and the patient's weal. Toughness and elasticity are essential qualities of a good clasp, and they are obtained by alloyment, in due proportion of gold with platinum. When about to fit clasps, I take the measure of the parts to be clasped with a piece of sheet-lead. This pattern enables me to approximate pretty nearly to the length and width which I desire, and prevents waste of material. The gold, having been cut according to its pattern, is rounded and smoothed on its edges, and, when annealed, is ready to be bent and shaped for use. My clasp fitting is done entirely with pliers—upon the teeth as they stand in the mouth, and my reliance is never upon any form of them which may be gained by impressions of plaster or wax. The part of a clasp first to be fitted should turn the posterior buccal corner of the tooth, passing along its approximal and flattened side, to wind around its lingual swells, thence *straight* across its anterior face to a point just short of ocular perception. The turn, at the place of beginning, should be long enough to embrace the corner and enable the patient, by catching with his finger nail, to remove the plate from the mouth. Clasps never should be allowed to irritate and inflame the gums—a difficulty easily avoided by a due regard for humanity and a skillful application. Having described the most perfect form and fashion of clasps, and having fitted them to the teeth, and the plate to the gums,

our next course must be to unite them in one piece. If we succeed in this without in any way impairing the excellence of the work already accomplished, we may indeed rejoice. The plate fits and the clasps fit. But the momentous question is—will they fit when united? I have seen the day, Mr. President, when to be able *confidently* to say yes to this question, would have been manna to my soul! This groping in darkness, attended by defeat, is hard upon the constitution, and as I look back to my early days of professional trial, I confess to have often endured the rack from this very inability to make *two* things fit when together, just as well as when apart. The plate and clasps being placed entirely in the mouth, we proceed next to take the *top plate impression*. This may be obtained in wax or plaster. I prefer wax. For this purpose, if I have taken the original impression in wax, it is preserved in the pan until needed. This impression should be softened by dipping in warm water, and, when withdrawn, should retain as much of it as may be in the clasp teeth wells, for the purpose of rendering their sides softer than the rest. Now insert the plastic wax. With the thumb and two fingers of each hand apply it. Steady now. Exert no undue pressure on any one part, but firmly and evenly do the work. Now withdraw it, steadily, carefully, and without rocking; *you have it now*—a try-plate impression—the very key (if you know how to use it) to ultimate success. With the impression in your hand—what next? Remove the plate and clasps from the mouth, and restore them to their impressions in the wax—but softly—the clasps first, and after them the plate. But softly *again*. You must not attempt to replace the clasps in the wax until you have expanded them with the pliers to an *easy* fit upon the teeth—a fit so easy that you may put on and take off, and feel that it is without friction and without stricture. With delicate tweezers lay them now gently, the plate and clasps, in their waxy beds. As they lie there, harmonious in relation, harmonious in place, you might well exclaim—beautiful! beautiful!! Fill up your impression with sand, plaster, and asbestos—give an hour for setting, and then with *hard* solder fasten them together—cleanse and smooth your plate, and try it in the mouth. If you have been faithful to my directions, you will discover how much like nice and frictionless machinery a plate and clasps may be.

It would be out of place and errant to my subject to pursue the further progress of this matter here; but rest assured, if artistic ability is requisite in the forming and fitting of plate and clasps, it does not cease until the denture is complete in all its parts and sits easily and kindly in the mouth—a work of utility and beauty—a real help to its possessor, and a credit to the creative mind and hand that planned and fashioned it.

DR. E. A. BOGUE'S IMPROVEMENT UPON THE KINGSLEY ARTIFICIAL PALATE.

BY GEO. H. CUSHING, CHICAGO, ILL.

FOR several months past I have been looking for some notice, in the *DENTAL COSMOS* or *Register*, of Dr. E. A. Bogue's improvement upon the justly celebrated Kingsley Artificial Palate.

This improvement was perfected some time in *May* last, and yet thus far, I think, no notice of it has appeared in any of the dental journals. This, it seems to me, should not be so, as I conceive that an improvement so valuable to the profession and to the public should be duly accredited to its author, and as no other pen appears ready to move in this matter, I propose briefly to state the chief points of merit which this improvement seems to claim, indulging the hope that through the instrumentality of this article, the invention may come to be more generally used, and suffering mankind thus more largely benefited.

All are familiar, I presume, with the description of the original Kingsley palate,—beautiful and ingenious in its design, and successful in its application; but those who are familiar with it, know how complicated it was in its structure, and that very delicate and skillful manipulation was requisite in its construction, while it proved upon experiment to be open to the objection that it became softened and unfit for use after being worn for a few months, rendering its frequent renewal necessary. Dr. Bogue's improvement simplifies very materially the instrument, rendering it not so liable to get out of order, while, by combining the hard with the soft rubber in its construction, together with its entirely different plan, it promises to do away, to a great degree at least, with the objection of softening.

The original Kingsley palate, as all know, was entirely of soft rubber, being made to fill completely the fissure, overlapping both above and below the muscles at the sides.

To enable the instrument to be fully effective, it was made capable of contraction and expansion laterally: contraction being effected by the action of the muscles upon it, and expansion produced by its own elasticity, while the lower surface of it was on a continuous plane from the anterior to the posterior margin. The improvement of Dr. Bogue consists in making the lower portion of the artificial palate, as far back as the posterior margin of the hard palate, of hard rubber, and the upper portion of soft rubber; the upper, or soft rubber portion, extending back as far as might be desirable to form a sort of apron, which lies closely upon and above the muscles of either side, and which is above the reach of the tongue. Thus the muscles are left free to act, by sliding *by* and *under* the soft rubber palate, not by contracting upon it. To all who are at all familiar with the construction of the original Kingsley palate, if I

have made my description at all clear, it will at once be apparent how much simplified the instrument is by Dr. Bogue's improvement. Its plan and principle are in fact entirely different from the original.

The softening which was found to occur in the original was chiefly in the lower portion which was in contact with the tongue, and it will appear from the description of the improvement that the tongue cannot come in contact with the soft rubber to any great extent, as the anterior lower portion is made of hard rubber, while the soft palate proper is carried above the reach of the tongue under ordinary conditions. Those put in after the improved method thus far have stood the test longer than any of the original style. Of course time can only determine how long they will prove efficient without renewal; but one recently examined, which was inserted six months since, shows as yet no sign of softening. As to the effectiveness of the improved palate as compared with the original, I think it recommends itself; but I have seen three cases in which the improved palate is worn, two of them made by Dr. Bogue and one by Dr. J. C. Dean, of Chicago. In two of these cases the Kingsley palate had been previously adapted by Dr. Bogue, and the patients expressed themselves as much better pleased with the improved than with the original, stating that the new instrument was worn with greater comfort, as well as that it seemed to accomplish more perfectly its intention than the old one.

Another improvement of Dr. Bogue's must not go unmentioned, and that is the adapting the moulds to the Whitney vulcanizing flasks, an improvement which those at all familiar with the process of making one of these palates will not fail to appreciate.

The profession and the cause of humanity are largely indebted to Dr. Kingsley for his beautiful invention, and perhaps scarcely less so to Dr. Bogue for his valuable improvement, which must eventually prove a great blessing to very many afflicted ones, and it is to be regretted that so few thus far have been benefited by the results of these gentlemen's labors in this direction.

So far as I am aware, but three dentists west of New York have successfully applied the instrument: Dr. Bogue, Dr. J. C. Dean, of Chicago, and Dr. Moore, of Leavenworth, Kansas. Doubtless there are others who may have done so, but these are all that have come to my knowledge. Surely it seems desirable that so great a boon to those afflicted with cleft palate should be more generally attainable than would seem to be the case. That it is not so, is doubtless due to the fact that no sufficient instructions have yet reached the profession generally, to induce them to undertake so difficult and delicate an operation, and it is to be hoped that Dr. Kingsley and Dr. Bogue both will very shortly furnish to the profession, through the pages of the *DENTAL COSMOS* and *Register*, full and explicit directions for the entire process, that those who desire and have occasion may be able to undertake, at least, to relieve such cases.

The making and adjusting properly these artificial palates require a high degree of skill, will always be an expensive operation, and never one to be coveted for the mere pleasure of it; but there are many dentists throughout the country who would undertake it, and some successfully, in the hope of being able to relieve those suffering from "cleft palate," if they had full and clear instructions, and thereby many more would be benefited than can now hope to be.

I fear I have not done full justice to Dr. Bogue's improvements in my description, but perhaps he will give a more satisfactory account of them himself, as well as directions for performing the necessary operations. My object in writing this article was twofold: to call the attention of the profession to what seem to me to be very valuable improvements (in justice to their author) upon an invention, the value of which we can as yet by no means fully appreciate, and to induce, if possible, the writing of such articles by Drs. Kingsley and Bogue as will stimulate the profession generally to extend the field to its broadest limits, wherein the beneficence of these valuable inventions may find demonstration.

I have no doubt that these gentlemen will cheerfully act upon the suggestion so soon as their attention is called to it.

RESTORATION OF THE NATURAL EXPRESSION OF THE FACE.

BY JOHN ALLEN, D.D.S., NEW YORK CITY.

Read before the Brooklyn Dental Association, February 8th, 1866.

SOME twenty years ago a member of the dental profession, then a resident of Cincinnati, Ohio, conceived the idea of restoring the natural contour of the face, in cases where the muscles had become sunken, by means of attachments or permanent fixtures to artificial dentures, of such form and size as to meet the requirements of each particular case.

After considerable experimenting, a practical result was obtained. This advanced step in our profession was hailed with delight by some and with little favor by others.

Many dentists attached but little importance to it because they had never seen anything of the kind before, nor had they seen it referred to, in all their dental readings, and still more, it had never been indorsed by the profession; consequently it could not be of much importance, or it would have been known and practiced before.

This kind of reasoning tends to retard the progress of every branch of science and art, for if none go beyond where others have gone, there can be no advance.

After the principle had become well established, by means of which sunken muscles of the face could be raised without detriment to the party restored, it was brought before the American Society of Dental Surgeons

in the City of New York, in August, 1845. That body of distinguished men, among whom were Drs. Eleazar Parmley, Chapin A. Harris, Elisha Townsend, Charles C. Allen, Amos Wescott, Lewis Roper, and many others of eminent distinction in their profession, saw in this improvement a new and important feature in dental practice, and the Association then gave it a hearty indorsement in the form of a beautiful gold medal.

Since that time this improvement has gradually advanced in public favor, and has now become a prominent feature in dental practice.

The human face is formed of different bones, muscles, nerves, etc., which give it form and expression. The various forms, positions, and functions of these different parts of the face should be well understood by the dentist who would construct dentures with a view of forming these attachments upon them, for they are so constructed as to become permanent fixtures or component parts of the denture, and of such form and dimensions as to bring out each muscle or sunken portion of the face to its original position, and, when properly formed, cannot be detected by the closest observer. The necessity for something of this kind had long been apparent, and many operators attempted to produce the desired effect by placing the teeth far out upon the plate; but when this was done, they would, in many cases, prove useless for masticating food; for the teeth, in order to be useful for this purpose, should be placed perpendicularly upon the alveolar ridges, and articulated in such a manner as to have the pressure in chewing come upon the inner, rather than the outer, margin of the natural gums. This position of the teeth will, in a great measure, prevent the plates from becoming dislodged from one side while chewing upon the opposite.

As before stated, the face is formed of different bones, muscles, etc., which give it shape and expression. The muscles of the face rest slightly upon the teeth, and when these organs are lost, and a consequent absorption of the alveolar processes has taken place, these muscles fall in or become sunken in a greater or less degree, according to the temperament of the person.

If the lymphatic predominates, the change may scarcely be perceived; but if a person is of a nervo-sanguine temperament it may be very great. There are four points of the face which the mere insertion of the teeth will not always restore, viz.: one upon each side, beneath the malar or cheek bone, and one upon each side of the base of the nose, in a line toward the front portion of the malar bone. The muscles situated upon the sides of the face, and which rest upon the molar teeth, are the *zygomaticus major*, *masseter*, and *buccinator*. The loss of the above teeth often causes these muscles to fall in. The muscles which form the upper portion of the face and lips are the *zygomaticus minor*, *levator anguli oris*, *levator labii superioris*, *levator labii superioris alæque nasi*, and *orbicularis oris*. These rest upon the incisor, cuspid, and bicuspid teeth,

which, when lost, allow the muscles to sink in, thereby changing the form and expression of the mouth.

The insertion of the front teeth will, in a great measure, bring out the lips, but there are two muscles in the front portion of the face which cannot, in many cases, be thus restored to their original position: one is the *zygomaticus minor*, which arises from the front part of the malar bone, and is inserted into the upper lip, above the angle of the mouth. The other is the *levator* muscle, which arises from the nasal process of the superior maxilla and from the edge of the orbit above the *infra-orbital* foramen. It is inserted into the *ala nasi*, or wing of the nose, and upper lip. The attachments before mentioned, applied to these four points of the face, beneath the muscles just described, bring out that narrowness and sunken expression about the upper lip and cheeks to the same breadth and fullness which they formerly displayed.

These attachments for restoring the form of the face were first constructed by the writer some twenty years ago, and they have been constantly worn by various persons with ease and comfort ever since that period.

Here the artistic skill of the dentist is brought into requisition. He should study the face of his patient as the artist studies his picture, for here he displays his genius, not upon canvas, but upon the living features of the face; and of how much more importance is the living picture that reflects the emotions of the soul than the lifeless form upon canvas! He should know the origin and insertion of every muscle of the face; which one he is to raise, and where to apply the attachments, otherwise he may produce distortion instead of restoration.

If these attachments are rightly formed and properly adapted, they will cause no discomfort in wearing them, nor any impediment in eating, speaking, or laughing. If skill and judgment have presided over all parts of the operation, the result will be highly pleasing, and of practical utility.

FILLING PULP CAVITIES.

BY C. E. LATIMER, D.D.S., NEW YORK.

UNTIL within the last eight or ten months I have been dissatisfied with my efforts at filling the roots of teeth, and have been earnestly wishing and searching for some better plan. It is true that those easy of access could be filled with gold foil quite compactly, but the great majority were not of this class, and when I had used my best efforts, I could not feel satisfied that the fillings were what they ought to be. Some of the roots I found so small and tortuous as to admit only the finest broach, and if I succeeded in getting gold half way to the apex it was all I could

do, and in many cases I was not even thus fortunate, where, from the inaccessible position, I could not succeed in getting a particle of gold in the root. Moreover, in order to obtain the free access requisite for a foil filling, much of the strength of the tooth frequently had to be sacrificed. This was a grave objection and gave me much trouble.

With regard to enlarging the canals, my experience has not been very flattering. Those which did not need it, could be drilled out, but those which really did require it, were not improved by my efforts. A shoulder would often be formed half way to the foramen, against which the filling would lodge, and all attempts to get a plugger further were useless. If a fine broach, such as would go into those small, crooked canals, were used, it must first be annealed, otherwise a few revolutions would fracture it, and when thus annealed it would not cut; hence I have given up all attempts at enlarging the canals, except in a few rare cases where I enlarge the foramen for the treatment of alveolar abscess.

I do not belong to that class who believe that cotton is the best material for filling pulp cavities. It is true, my experience has not been extensive in this direction, but I have taken out a few cotton fillings from the roots of ulcerated teeth, the odor of which has constrained me to rejoice that my experience was thus limited. I cannot say whether the cotton was put in with the mallet in these cases or not.

Other operators may have a different class of teeth to work upon from those which come to me; indeed, I am frequently inclined to think so when I hear first-class authority talk about malleting gold to the apex of the root, or when I see the immense nerve broaches and pluggers in the market, and which are so favorably spoken of by everybody.

My present plan is as follows: after having used the Nos. 2 and 3 Swiss broaches for removing the nerves from teeth as directed by my brother, Dr. J. S. Latimer, in the DENTAL COSMOS a few months ago, I prepare them for use by burnishing them upon a hard surface until they are rendered sufficiently stiff and elastic. This should smooth down the barbs and leave them straight. I now cut a strip of gold foil (Nos. 4 or 5 preferred) from one-fourth to half an inch wide, depending upon the size of the foramen; this is firmly rolled upon the broach, being sure that the point is covered. It may now be clipped off of suitable lengths for filling the root, dipped in creosote, and forced into the canal. In many cases the mallet may be employed to advantage by using a plugger with a slight concavity in the working end, which will prevent the end of the broach from slipping, and drive it firmly into the foramen, thereby closing it pretty effectually.

If the canal will permit it, other broaches similarly prepared may be forced in around this until the root shall be filled; or, if large, gold foil may be packed in around the broaches, a part of the distance.

I feel confident that after a fair trial this method will be highly prized

by many, and especially for small tortuous canals, or in cases where the cavity of decay is almost at a right angle with the canals. It is really gratifying to know how little space is requisite to enable a careful operator to remove a pulp and fill a canal with these broaches.

COBALT AS AN APPLICATION FOR EXPOSED PULPS.

BY W. DICKINSON, CHARLES CITY, IOWA.

IN all the articles I have seen lately in regard to the destruction of exposed pulp preparatory to filling, I have noticed that invariably the use of arsenic and creosote was advocated as the best application for the purpose. While I think in many cases it is as good as any other, I think on the other hand that for general use cobalt is better. In most of our standard works, arsenic takes precedence over all other agents; still, they are all very particular to enjoin *caution* on all who employ it, and as various possible evil effects are laid down, which would ensue from anything else than a *very* careful use of it, I do not propose to enter into any elaborate argument in favor of one or the other, but will simply give the details of an ordinary case under the cobalt treatment. Having arrived at the conclusion, by accurate examination, that the nerve must die at my hands, I carefully excavate all the carious matter that I can from the cavity without giving too much pain—trying at the same time to *fairly* expose the pulp if not already exposed, and in many instances it is not; for oftentimes, after the removal of the “medicine,” we find we have considerable work to do before we are able to introduce instruments for its removal. I then place in the cavity a small pledget of cotton moistened with creosote and cobalt, taking particular care that it is in direct contact with the nerve. Cover in the usual manner with wax or anything else preferred to retain it there, and dismiss the patient till next day, when I thoroughly remove the nerve with a *fine* nerve needle, flattened at the point and bent to nearly a right angle; an application of creosote and tannin is then made in the same manner as before—to remain till the following day, when the tooth will be ready to fill. After finishing preparations to fill, I warm a small piece of Hill’s stopping, or gutta-percha, if the other is not at hand, and with as large a flat-headed bur as I can use conveniently in the cavity, I gently press the nerve *canal* full—the patient to inform me of the fact. After allowing to cool a moment, I remove all from the *pulp* chamber, and fill as if the nerve still existed. I much prefer this method to trying to fill the root with gold, for this reason: that by it there is not the least danger of leaving “a reservoir for the accumulation of morbid matter,” which will eventually give trouble if left. For the first application, from fifteen to twenty hours are generally sufficient. I prefer that the nerve should bleed a little when removing, and that sensibility should not

be entirely gone—as it is not if it bleeds—for then all possibility of injury to the subjacent parts by an overdose will be obviated. The patient should be requested to remove the first application if prevented from coming the succeeding day after it is made. It will be seen that I do not consider even cobalt *perfectly safe*, under *all* circumstances, but, as I said above, I think it more so than arsenic. I have been led to the use of the former agent, partly from the fact that I have never seen any untoward effects from its application, never having had a patient return to complain of evil effects, while I have had complaints after the use of arsenic.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

(Continued from p. 477.)

Dr. Breen's experience has been an endeavor to save teeth by treating, rather than to sacrifice them by extracting; he extirpated after devitalizing, then treats with creosote, from four to six days before filling, then fills with gold as near the apex as possible.

Dr. Ellis said that it seemed unnecessary to consume time in giving his views upon the arsenic question, as they coincided with those of the preceding speaker, except in a few minor details practically unimportant.

He would, however, enter a strong protest against the practice of extirpating pulps without preparatory obtunding treatment, and deemed it, although advocated by some gentlemen of professional prominence, an inhuman operation, unwarranted by any fancied or real advantages.

It should be the aim and ambition of the dentist to alleviate suffering, to perform painless as well as perfect operations, a policy the adoption of which will inspire in the patient confidence and appreciation, and beget in the operator similarly pleasurable and satisfactory feelings.

He thought it a matter of grave importance that we should recognize this claim and study the avoidance of pain as far as consistent with thoroughness; for through neglect of this precaution, many practitioners have been unintentionally instrumental in awakening fears that have deterred the timid from again seeking dental services, and thus consigned them to the tortures of toothache with its attendant ills and the early possession of edentulous jaws.

Dr. James E. Garretson remarked that it was with alveolar abscesses, as with abscesses in other positions, circumstances would be found to modify treatment; Dr. Flagg might, in his cases, find the let-alone mode

answer every purpose. The gentleman certainly knew all about alveolar abscesses, and he, of course, had not one word to say against any kind of treatment the doctor might be pleased to adopt, or might express himself as finding successful. In his own practice, however, he had very frequently found himself compelled to resort to the most energetic means, not only locally, but constitutionally; remarked that treatment, from a constitutional stand-point, demanded much more consideration than it commonly received. Abscesses that lingered under a do-nothing treatment, and were much worse by local stimulation, would not unfrequently be found to yield, happily and readily, to a few grains of quinine and iron per diem, when an alveolar abscess refused to yield quickly to a local medication. Dr. Garretson said he at once commenced an inquiry of the system as to the cause, and seldom made such inquiries without satisfactory answer. A little neutral mixture would, in a febrile subject, sometimes cure an angry-looking abscess in a day or two. A dose of Epsom salts might, under circumstances, be enough for a case. The mineral acids would sometimes work like a charm. Ale, porter, wines, brandy, generous living, oftentimes would be found to effect a change in an indolent abscess in a single day. Dr. Garretson referred to non-uniting fractures as the result of constitutional vibration, the specific diseases, etc., and drew the likeness existing between such cases and non-healing alveolar abscesses; alluded to treatment in these cases, and exhibited the fact of the demands in both conditions being the same; remarked that, as the general surgeon found it impossible to unite his fractures without a resort to the indicated remedies, so, of course, would the dental surgeon find his cure as intractable without recourse to similar means.

The pathology and features of alveolar abscesses are, in the most of cases, very simple, but sometimes it happens that the affection is quite difficult of diagnosis. Dr. Garretson mentioned in this connection many interesting cases coming under his own notice; one, of particular interest, as existing in the form of an open ulcer on the apex of the chin for a period of seven years, and which had deceived quite a number of gentlemen as to its true character. The doctor also alluded to cold abscesses as being a peculiar, and a somewhat uncommon form of periodontal trouble; described them as the analogues of the ordinary scrofulous abscess; particularly he said was such a relationship to be inferred when such abscesses were found on the persons of children; had treated them, however, in individuals in whom certainly no such diathesis existed.

He remarked that there were cases of alveolar abscess occurring in individual cases that no earthly skill could cure without a removal of the tooth which was the offending cause: the explanation lay in the excessive and insurmountable irritability of the person. In such cases, a devitalized tooth is just as much a foreign body as would be a splint of wood or metal.

Dr. Tees filled the root in such a manner as to permit of easy removal in case of alveolar abscess at any future time. He used fine gold wire, with a screw-thread cut upon one end by means of a file—around this, a small piece of raw cotton was wound, and moistened with creosote. This was pressed up to the apex of the root. The end of the wire he allowed to remain in the cavity in the crown. The entrance to the canal was then enlarged and filled with gold or Hill's stopping. In case of alveolar abscess at any future time, the filling can be removed and the wire pulled out with the tweezers. During the past year or two he had treated several cases of exposed pulp where it was not at the time nor had been inflamed. So far he has been successful with these cases; but it was of course uncertain whether the treatment would be attended with success after the lapse of several years. He had seen them after being filled a year or so, and they presented every appearance of containing living pulps. He placed a small piece of cotton with creosote upon the exposed pulp and filled over with os artificiel. With these exceptions, in case of exposed pulp, he devitalizes and fills the fangs in the manner described.

Dr. Bonwill had found twenty-four hours sufficient time to allow arsenious acid to remain; desiring simply to obtund sensibility of pulp, and not cause it to slough entirely from the apex. Less liable to abscess. Believed it would heal by *first intention*, and not by granulation, as will certainly result from the prolonged contact of acid. As soon as pulp is extracted, which should be upon removal of preparation, then filled temporarily, at once, with as little admission of air as possible. Allowed this to remain for six or eight weeks, until there is no probability of abscess, and then filled canal with gold, tin, or cotton. Used the latter *only* in those canals where impossible to condense any metal. Believed *tin* as good as *gold*. Has had abscess from those roots where it was difficult to extirpate pulp, from the diminutive calibre of canal. Believed it owing to some remains of the pulp, and not the presence of cotton. Considered thorough removal more important than all else, though every vacuity should be filled when practicable—cotton, if nothing else. Had extirpated the freshly exposed pulp without any *acid*, and filled immediately. Knew of no abscess resulting therefrom. The stuffing in of acid, without any preparation of cavity, had no doubt been the generator of so much periostitis, also in placing in the sandarac or wax stopping, causing it to be pressed out on the adjacent gums. Had one fatal case from second application of acid. Seldom made more than one. Rubbed up acid at the time with creosote. Had found no benefit from morphia. Care in the manipulations, will guarantee painless after-effects. Had used galvanic current in many cases, with great success, except when much inflammation was present. Arsenic would come nearer filling all the in-

dications than any one article. Swabs out with creosote before final filling.

Dr. Ellis thought, from the tenor of the remarks, that Dr. Flagg had been misapprehended in relation to the duration of arsenical applications, for while diligently seeking to avoid the reported dangers of that drug, he had inadvertently become apprised of its comparative innocence, and would now testify that although the lengthy contact of arsenical medicaments is not a "*sine qua non*" for pulp devitalization, neither is it provocative of those magnified dangers usually ascribed to it.

In his practice he *occasionally* extirpates the pulp after 24 or 48 hours' application; *frequently* allows the arsenic to remain one or two weeks; in *many instances* has, through neglect of a patient, been afforded most conclusive evidence of the usually innocent character of the agent when carefully applied, two of which occurred a few days since, where the drug had remained in intimate contact with the pulp tissue for three or four months, without any injurious consequences resulting, as can be testified by several professional friends who had an opportunity of examining the cases.

Recognizing that it is a *prompt obtunding* rather than a *prompt devitalization* that follows, he prefers the following practice for the following reasons, viz.: If early removal is demanded or desired, extirpates after 24 hours, as the sensibility of the body of the pulp is generally well destroyed by that time, yet in most cases a decided twinge of pain attends the severance of the tissue at the apical foramen. If time is no consideration, allows it to remain until sloughing of the pulp has ensued, and from the dissolution of its connection with the economy it has become a foreign body, and is readily removed, with a certainty of its entire withdrawal. The time for the accomplishment of this result varies, the average being about two weeks.

After the lapse of more than 48 hours, prefers to wait for the latter result, as he has observed the interval characterized by a partial recovery of sensation prior to the complete suspension of vitality, and probably due to the partial recovery from a shock adequate to its final destruction.

Gentlemen had objected to cotton-root filling upon the ground that "they do not insert fillings for the purpose of indulging in their subsequent removal." He claimed equal freedom from any such intentions, and believed he enjoyed an equal immunity from the necessity of such undesirable and unprofitable employment; yet if the cotton serves the purposes of a filling equally as well as gold, and presents the additional recommendation of easy withdrawal, it is preferable, in enabling us to save rather than sacrifice those exceptional cases requiring such treatment.

Took exception to Dr. Bönwill's statement relative to the healing of a lacerated pulp extremity by first intention, a term employed to designate the union of tissue by the close apposition of clean, smooth sur-

faces, deemed by some authorities producible without inflammatory action, but requiring certain conditions for its fulfillment, prominent among which is the close adjustment of the parts, and their retention in such perfect proximity. The dental pulp when lacerated heals as other lacerated tissue by the granulating process, termed, in contradistinction to the former, the second intention.

Dr. Bonwill, time permitting, would argue the principle of healing by first intention, objected to by Dr. Ellis. At the earliest opportunity will fill the pulp canal with cotton steeped in gutta-percha dissolved in chloroform, allowing time to evaporate before filling crown. Believed it would be the easiest and best way of treating the smaller canals.

Dr. Ellis objected to the practice of thorough excavation of cavity prior to the application of arsenic, as necessitating the infliction of much unnecessary pain; is cautious, and would advise care in its introduction and confinement;—had never had any injury result from its escape, not being able to count even a single case of difficulty traceable to such cause. Considered that no advantage could be derived from temporary fillings where there had been thorough extirpation; and if such practice was adopted with the view of demonstrating liability to abscess, their value would amount to naught in the vast majority of cases, unless continued six or eight months, or even longer, rather than six or eight weeks.

Dr. McQuillen had no desire to be understood as taking exceptions to any mode of practice in which there was prospect of saving a tooth even for a few years; therefore, if other gentlemen preferred to employ cotton as a filling for the pulp cavity, and they conscientiously believed that they could serve their patients better by using that material, he had nothing to say; but he did object most emphatically and distinctly to the assertion that it was decidedly preferable to gold foil. Cotton and dentine as organic substances are liable to run into decomposition. This, however, is not true of a metallic substance like gold, for although it is exposed to external influences, the process of disintegration is a much slower one, and in the case of hard, compact gold fillings, he has known them to stand for twenty, thirty, and forty years; it is exceedingly doubtful whether a tooth with a cotton filling in the pulp cavity would last for that length of time. As a rule, he preferred to remove the arsenical paste, and if devitalized, the pulp, at the expiration of 24 hours, and in effecting this he had found some broaches prepared by Dr. Latimer, of New York, among the best which he had ever employed for that purpose.

Dr. Harris spoke to the class of students present a word of encouragement on the importance of attending at these discussions; privileges such as these not having been the lot of those who studied when the speaker did, and, together with the other disadvantages, the absence of dental colleges, and discussions upon dental subjects, made it more of an up-hill work.

Dr. Stellwagen, in answer to the cautions kindly given to the class of students present, thought that no better evidence of their appreciation of the importance of careful manipulations could be given than the fact of there having been no trouble from the incautious use of arsenic in the college clinic. So far as he could remember, there was but one baffling case, and this due to an idiosyncrasy of the patient, which had been met and overcome. His constant association with the class, as Demonstrator of Operative Dentistry in this college, has given him ample opportunity to observe the unusual success met with, which he felt should be a cause for congratulation on the part of the students and the profession.

This occasion called to mind two teeth lately seen by him from the hands of operators of more or less celebrity, where the preparing and filling of the pulp cavities and canals were so carelessly performed, that if the work of mere tyros, it should even to such be a subject for deep mortification. These cases are merely mentioned as a reminder that some oftener fail from inattention than inability.

The Executive Committee reported favorably on the election of Drs. Saml. J. Dickey and Geo. C. Loar, who were unanimously elected as active members.

The Society then adjourned, to meet in the same place on Monday, March 5th, 1866, at 8 P.M.

REPORT OF DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

At a meeting held January 3d, 1866, Norman W. Kingsley gave notice that he is preparing a complete treatise on DENTAL MECHANISM. No work extant is sufficiently full on the subject of irregularity and its treatment. To the end that he may be able to supply this deficiency in his proposed work, he invited gentlemen to lend him any models of peculiar or difficult cases and apparatuses they possess, that he may have drawings made.

John Allen, D.D.S., read a paper upon the subject of DENTAL NUTRITION AND FOODS, WITH ESPECIAL REFERENCE TO DENTAL CARIES, the subject of the evening.

G. F. Foote, M.D., read a paper on the CAUSES OF DENTAL CARIES, which it is hoped he will cause to be published.

J. F. G. Colburn, D.D.S., said that the food of the Sandwich Islanders, though fermented, and containing a large amount of acid as a consequence, is yet replete with the phosphates.

The great desideratum is a good shield of enamel for the teeth, and in order to get this we must see that the food is well supplied with phosphates. Bread made of fine flour is notoriously deficient in tooth-making material.

Spoke of a case of a Sandwich Island woman who became the wife of a European, and fed on fine flour and luxuries, to which he had called attention on a previous occasion. Her case illustrated the fact that it was not altogether climate and race that predisposed to caries, but food had much to do with it.

B. W. Franklin said that as the lady referred to got her teeth before she married the European, and hence had as good enamel as her natural mode of living could give, the cause of her subsequent dental ailments must be considered adventitious, and not at all consequent upon the amount of *lime* in her food.

He claimed that when the nursing mother is losing her teeth from acid oral secretions, her *milk* is acid, and her child is injured thereby.

We should eat meat and vegetables uncooked as indicated by nature in the habits of other animals.

John M. Crowell claimed that we have no soils in this country sufficiently supplied with the phosphates. He had tried on his farm in New Jersey to raise blooded stock, but could not get a colt to stand when foaled until he supplied the salts to the land and also directly to the dam with her food.

Geo. F. Foote, M.D., claimed that want of use had much to do with dental caries. Did not believe that acid produced by the decomposition of vegetable substances between and around the teeth is the direct cause, though they were enfeebled by this product of fermentation; the mucous membrane is irritated by it, and caused to furnish a large amount of acid mucus, by which the teeth were broken down. If we breathe through the mouth, especially during sleep, the air irritates the mucous membrane and makes it pour out mucus copiously; from this the water is evaporated and the concentrated acid acts vigorously on the teeth.

When children have a diarrhœa tendency, the product of the mucous membrane is acid, which erodes or irritates the parts. The so-called dental irritation he ignores. In "white decay" is indicated not a deficiency of lime salts but rather a want of gluten.

Wheat contains but a small per cent. of lime, but the berry, just within the external shell, is rich in gluten, essential to the formation of the cartilaginous portion of the tooth. Our American wheat contains some 18 per cent. of gluten. If we reject the kernel, we lose the larger proportion of this essential ingredient. The bran contains little nutriment, and hence he would reject it from his Graham bread, unless the prevalence of constipation rendered it essential as an irritant to the intestinal canal.

The essential volatile oil of hops is capable of preventing the acetous stage of fermentation. He adds a little of the cold infusion of *fresh* hops to his yeast, and though his bread, if neglected too long, may pass the saccharine stage, it never gets sour. He did not think best to medically treat our patients, but we should educate physicians, and each dentist should have his medical mate. A medical practitioner of his acquaintance has a plate in his mouth which has not been removed for four years.

John Allen, D.D.S., differed widely from Dr. Foote with reference to the wanting constituent in defective teeth and also with regard to the amount of lime in bran.

Phosphate of lime exists in *large* proportion in the hull or bran of wheat, and this is the substance required to give us perfect teeth and bones. He contended that we could not overestimate the value of an enlightened discrimination in the selection of foods, for however active the assimilative power may be, there is no power on the part of the system to *create* the materials for tissues. In proof of this he cited many authorities.

C. P. Fitch, M.D., was afraid many dentists ascribed the continuance of decay, after the teeth were filled, to defective dental structure and acid diathesis, when the fault was really in their own imperfect work. We should be careful how we hide incompetence behind falsehoods. This he said, well knowing that there are cases which filling, however well done, will not save. He did not believe in caries commencing within the teeth. The constitutional causes are predisposing; the direct or immediate cause is always acid.

The chemical analyses differ as much as does the density of the teeth examined. Dental structures are determined for the child, to a great extent, by the parents. The elements of the teeth must not only be supplied to the child, but the power to assimilate must be present in order that the desired good may follow. There is a marked agreement between the diathesis and the teeth, so much so that the one may be taken as an index of the other.

Thought that as a profession we should employ some means of informing parents how they may obtain good organisms for their children. In disease the secretory and excretory functions are unbalanced.

The skin should be kept in order so that its excretory functions may be properly performed. If the emunctories do not act sufficiently, the products of combustion and other effete matter remain to poison the system: in this manner many febrile and inflammatory diseases take their rise. Medication should not be confined to the stomach, but the skin should be made to absorb remedies.

Had never seen decay progressing where turmeric indicated alkalinity. If the oral fluids are acid, he would treat with acid constitutionally.

It is a fallacy to suppose that acids taken into the stomach can cause acidity of the secretions; on the contrary, they supplied oxygen to correct the carbonaceous excess in the system. Chlorate of potassa would do the same thing.

We need not adopt the habits of the Indians to insure good teeth. He did not think the waste and supply of material to teeth after their completion materially affected by food; the organic change is small.

I. W. Lyon thought our daily habits had much to do with caries. The Indians live naturally and have no dental ills. They *use* their teeth.

They subsist on acorns ground in concavities in the rocks. They also eat the barks and roots of trees and plants. He would inquire whether *use* might not have a tendency to make the jaws broad and strong? The Indians drink less than we.

A. C. Castle, M.D., read an interesting paper on CARIES, which was some time since published in a Boston medical journal. He claimed that the green collection on the teeth of children is gastric acid. He had seen teeth decay in a manner to lead to the belief that caries may commence within the tooth. It is not possible to save teeth under all circumstances. We need not lose ourselves in finified theories, for our every-day observations prove the fact that some teeth decay in *spite* of our best efforts, and others *never* decay however much neglected.

Females are more subject to dental caries during gestation and lactation than at other times, because then there is a greater amount of gastric acid brought in contact with the teeth.

As to the superiority of the Indians, it should be borne in mind that only the more rugged offspring were able to survive the rough treatment they received. This weeding out the weaker and leaving only the strong to perpetuate the race had been beneficial to its physical organizations.

With reference to food, he deemed the great stress laid by some gentlemen upon particular foods, as entirely unnecessary. Phosphate of lime is furnished in abundance in milk and nearly all the vegetable and animal foods, so there is no want of this salt in the system. He claimed that a German chemist found in the solid constituents of blood, milk, saliva, muscle, serum, and bone, about 28 per cent. of phosphate of lime and some 5 per cent. of the phosphate of soda.

Geo. F. Schaffer presented for the inspection of the Society some impression cups, invented and patented by him. These cups are of German silver, and made in sections. If natural teeth remain, one or more of these sections may be removed to permit the tooth or teeth to pass through the cups. The society gave him a vote of thanks.

TRANSACTIONS OF THE BROOKLYN DENTAL ASSOCIATION.

BY W. C. HORNE.

February 8th, 1866.

DR. G. F. SCHAFER exhibited to the Association an impression cup of his devising, in size and form similar to those now in use; the new feature consisting of adjustable plates secured to the outer and inner rims of the cup, instead of a solid bottom. In partial impressions, or in cases of long teeth, by removing the plate opposite to the opposing tooth, it is allowed to pass through the bottom of the cup, the same being true of several teeth. In this manner a better impression is obtained, with less of the plastic material, and consequently with greater ease to patient and

operator, and avoiding the annoyance of cutting holes, as usual in the common impression cup.

The Secretary, by order, returned the thanks of the Association to Dr. Schaffer for his valuable improvement.

Dr. G. F. Foote exhibited specimen plates of black vulcanite.

Dr. N. C. Fowler, of Boston, exhibited specimen plates of aluminum, to which the teeth were attached by a vulcanized mixture of aluminum with ten per cent. of pure rubber and sulphur.

The Corresponding Secretary reported the receipt of the Transactions of the Odontographic Society of Pennsylvania, which he was directed to acknowledge, with the thanks of the Association.

Dr. John Allen read a paper upon the "RESTORATION OF THE NATURAL EXPRESSION OF THE FACE."*

In reply to a question, Dr. Allen stated further that he sometimes builds out lower sets, but generally confines this to upper ones.

Dr. C. E. Latimer said he had applied the fixtures for restoration of the form of the face, but found they gave the voice a hollow, whistling sound, which was very objectionable.

Dr. J. Allen had overcome that difficulty as long ago as the second year of his efforts in this matter.

Dr. Kingsley said that in restoring the expression of the features, we were not limited to attachments to the plates, but the color, shape, size, and position of the teeth, all tended greatly to modify the result. He believed it not best always to attempt to restore the original expression, but rather to study what would then have an agreeable and pleasing effect. For this purpose the continuous gum is unequaled; each tooth has its character, which should harmonize with the features, and this character may be modified by irregularities of position, as well as in other ways; and all efforts should be made with direct reference to the temperament, age, character, and the like, of the individual. He claimed that greater skill and genius are requisite to do justice to mechanical dentistry, than are generally exhibited by the most skillful operators upon the natural teeth.

Dr. J. S. Dodge had, in some cases, obtained results very pleasing to his patients, by imitating the teeth of a near relative.

Dr. Franklin thought that we ought to be able to decide what teeth will correspond with the features without consulting the faces of relatives. If we set the teeth so that they will be useful, they will not restore the muscles to their lost position. To decide where plumpers should be applied, place the finger under the muscles to be raised, and notice where the resistance is.

Making plates fit the mouth is not all that needs to be done. He indorsed the remark of Dr. Kingsley, that greater skill is required in adapting artificial teeth, than in making good plugs.

* See page 527.

February 21st, 1866.

The regular essayist, Dr. J. W. Clowes, read a paper on the subject of dissertation for the evening, viz.: "CLASPS AS FASTENINGS FOR ARTIFICIAL DENTURES."*

Dr. Kingsley's method was not very dissimilar from Dr. Clowes! He had hardly supposed that a paper on this subject could have been made so interesting. He would decidedly object to altering the shape of the tooth for the sake of obtaining a better hold for the clasp; a good result might be obtained without that; and with ordinary care on the part of the patient, clasps need not hurt the teeth. He also urged that plates, when supported by atmospheric pressure, should be made of a strong but narrow strip of gold, running along close by the teeth, and attached back of the bicuspid to the suction plate in the posterior portion of the roof of the mouth. By this course, the speech is much less changed than when the anterior portion of the roof is covered.

Dr. Franklin would not sanction the filing of sound teeth.

Dr. Foote was decidedly of the opinion that clasps are a nuisance. The enamel is the natural protection of teeth, and when perfect it is not liable to injury by any acid that gets into the mouth. He quoted L. S. Beale as authority for the statement that no acid except nitric would destroy the enamel of a sound tooth.

Dr. Kingsley regretted that in inserting artificial palates he was obliged to clasp around teeth; but he always gained space by wedging, never by filing. In many cases he used a collar running around several teeth in preference to a clasp.

Dr. Latimer would prefer having three collars to one clasp going round a tooth. When a clasp was necessary, he would have it near the crown with a standard to connect it to the plate.

Dr. Clowes explained that in filing teeth he never removed all the enamel; the dentine should not be exposed; and he was careful to use every means of fine files, prohibiting powders and burnishers, to leave the filed surface perfectly smooth.

Dr. Kingsley, in answer to a question, said he did not consider the imitation of the rugæ in artificial plates essential. He presumed they were of use in mastication, when the mouth was in its natural state.

CONNECTICUT STATE DENTAL ASSOCIATION.

HARTFORD, CONN., April 10th, 1866.

THE second annual meeting of the "Connecticut State Dental Association" will be held in New Haven, on Tuesday, the 15th of May next.

LEROY D. PELTON, *Corresponding Secretary.*

* See page 522.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held April 2d, 1866, the following officers were elected, viz.:

President.—Dr. J. W. Ellis.

1st Vice-President.—Dr. M. W. Sherwood.

2d Vice-President.—Dr. S. B. Noble.

Corresponding and Recording Secretary.—Dr. J. C. Dean.

Treasurer.—Dr. Wm. Albaugh.

Librarian.—Dr. W. A. Stevens.

Executive Committee.—Drs. M. S. Dean, W. C. Dyer, A. J. Harris.
J. C. DEAN, *Secretary.*

EDITORIAL.

THE ATMOSPHERIC ODORATOR.

IN the practice of dentistry a number of articles are, of necessity, in daily and constant use, which are calculated to impart to the atmosphere of the operating-rooms a very unpleasant, and, to many patients, an exceedingly disagreeable odor. Creosote, iodine, ether, etc. are among this number; and it is a duty that a professional man, as a gentleman, owes to refined and sensitive patients that they should have the least possible cause of annoyance or complaint in this particular. Such agents, when not in use, should be kept in tightly ground-glass stoppered bottles and under cover. To neutralize their presence in the room after being used, due attention should be paid to ventilation; by throwing open the windows, back and front, for a few minutes after exhibiting ether, much of the unpleasant odor of that material can be removed. The presence of bouquets of flowers in the rooms during the warm months, in addition to giving evidence of taste and refinement on the part of the occupant, will also impart to the air a delightful odor well calculated to obviate the unpleasant evidences that might otherwise prevail of the drugs referred to. In the winter-time, or when it is difficult to procure flowers, an instrument named "The Atmospheric Odorator" will be found of decided use. It consists of a short glass tube, placed at right angles with a longer tube. The end of the long tube is placed into a bottle of perfume, and the breath of any person, on being blown sharply through the short tube, will convert a few drops of perfume into thousands of minute particles, impregnating the surrounding atmosphere with fragrant odor. Attention to little matters such as these will not only evince a proper regard for the comfort of patients, but will also be duly appreciated by them.

J. H. M'Q.

INJURIOUS RESULTS OF AN EARLY EXTRACTION OF THE PERMANENT TEETH.

IN another portion of this number, an excellent paper is presented by Dr. A. C. Hawes, denouncing, in unmeasured language, the abominable practice of indiscriminately extracting the anterior permanent molars. In this day of general intelligence on the part of the American people in everything that relates to the human economy, and particularly the dental organs, it is a matter of surprise that any parent can be found so ignorant as to request the premature extraction of these teeth; or that any dental practitioner can be found so lost to what is due his patient, his profession, or himself, as to consent to be an agent in the performance of such a barbarous and unprofessional act. It is trusted that the paper may have a beneficial effect upon the benighted persons who indulge in this practice.

J. H. M'Q.

CORRESPONDENCE.

HARRISBURG, PA., April 12th, 1866.

DR. J. H. MCQUILLEN.

DEAR SIR:—Allow me, through the DENTAL COSMOS, to call the attention of the profession to a little matter that I think we will all feel some interest in. The State Library is to be removed next summer into the new extension that has been built to the Capitol; and it is proposed to assign an apartment in it to the specialty of dentistry, and to procure for it as complete a collection as possible of all the respectable dental works that have been published.

As many of these works are out of print, and consequently not on sale in the ordinary way, an appeal is made to the profession generally, and especially in Pennsylvania, to assist in carrying out the object contemplated. It is believed there are some dentists who would be willing to spare from their well-filled libraries such works of the early authors as it would be difficult, if not impossible, to obtain otherwise. If so, they will confer a favor by sending to the undersigned a list of such as they would be willing to part with, naming prices, and noting whether in good condition or not. And if there is any one who has to spare a complete and well-bound copy of the *American Journal of Dental Science*, and of the *Dental News Letter* and DENTAL COSMOS, or any other of the early respectable publications, he will please make known as above. And if any one should feel disposed to *donate* anything either rare or valuable for this purpose, it will be thankfully received and deposited in his name.

Booksellers are invited to send catalogues of such dental works as they may have on hand. As soon as a list can be made out, the books will all be ordered. Direct to

JAMES FLEMING, M.D., D.D.S.,

HARRISBURG, PA.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"Local Anæsthesia. By BENJ. W. RICHARDSON, M.A., M.D., F.R.C.P., Senior Physician to the Royal Infirmary for Diseases of the Chest.—**THE PRINCIPLE AND THE PRACTICE.**—The new method of producing local anæsthesia which I had the pleasure of introducing to the profession in the pages of this journal on the third of last month has created an interest which, at the most sanguine moments, I did not anticipate. This success is due in a great measure to the simplicity of the process, its readiness of application, and its determinate and demonstrative action; but the most important element in the success is, that the new process supplies a want long felt in every class of the profession—namely, a ready means of removing pain arising from surgical operations or other causes without the risk of sacrificing life.

"The short paper I now write may be considered as an answer, in a general sense, to the various questions and suggestions that have been addressed to me since my last communication. For convenience, I may classify this series of answers under four heads. 1. The principle of the new process of local anæsthesia. 2. The instrument to be used. 3. The fluid to be used. 4. The mode of application.

"The Principle of the Process.—The principle of the new anæsthetic process consists in directing on a part of the body a volatile liquid having a boiling point at or below blood heat, in a state of fine subdivision, or spray, such subdivision being produced by the action of air or other gaseous substance on the volatile liquid to be dispersed.

"When the volatile fluid, dispersed in the form of spray, falls on the human body, it comes with force into the most minute contact with the surface upon which it strikes. As a result there is rapid evaporation of the volatile fluid, and so great an evolution of heat force from the surface of the body struck, that the blood cannot supply the equivalent loss. The part consequently dies for the moment, and is insensible, as in death; but as the *vis a tergo* of the body is unaffected, the blood, so soon as the external reducing agency is withdrawn, quickly makes its way again through the dead parts, and restoration is immediate. The extreme rapidity of the action of this deadening process is the cause of its safety. The process can suspend life without causing disorganization; if I may use the expression, it produces syncope of the part—temporary death—but not necessarily destruction. When we produce general anæsthesia we virtually extend this mere local action to the body altogether—*i.e.* we check the evolution of force at the centre, and produce an approach to temporary death of the whole of the organism.

"The Instrument.—Improvements.—The instrument by which the volatile fluid is dispersed is described at length in my paper published in this journal on February the third of this year. It consists of a spray-tube and bottle worked by Dr. Andrew Clark's hand bellows. The tube differs from all other spray-tubes in that the volatile fluid is brought up for dispersion by air pressure produced by the same motion as that which causes the dispersion. The instrument also provides a means for regu-

lating the current of fluid; it allows the ether to be carried along tubes of any convenient length and curve; and, lastly, it enables us to construct a *compound* instrument by which the effects may be multiplied to any reasonable extent for large operations.

"In my original paper, referred to above, I described simply the single dispersion tube. Since then, I have made a large number of tubes to answer various powers and purposes. I have a tube in which there is a bulb enlargement at the end with perforated side, or side and central jets. This tube is exceedingly useful for the cavities of the body, such as the vagina or rectum. It distributes the fluid in the same manner as a syringe with several perforations at its point. In practice, I find that the dispersion of the fluid delivered from one fine tube by a series of jets is not so efficient, proportionately, as when it is delivered by one jet: the fluid, that is to say, requires a certain degree of concentration to insure success.

"In order to multiply the anæsthetic producing power, I have other instruments constructed which may be called compound. In these cases the bottle holding the volatile fluid either receives a common central tube of large size communicating with a number of terminal jets, or each terminal jet has a separate jet running into the fluid. By this means I have a brush of jets, which may be circular, or long, or flat, as required. For this compound tube a six-ounce containing bottle for the fluid is necessary, and additional bellows power. The present small hand bellows will only work a compound jet of two elements with efficiency. I have tried to meet this difficulty by using a bellows worked by the foot, but not as yet to my full satisfaction. To get the air pressure I have tried various plans so as to do away with the hand bellows. I have used carbonic acid compressed into an iron bottle, and have applied the gas in its escape so as to act in the same manner as the air from the bellows. The apparatus complicates, and the pressure of gas cannot be nicely regulated. I have modified this plan also by trying to get force by generating carbonic acid gas at the time; also by generating hydrogen from zinc and dilute sulphuric acid, and using the pressure of the gas as the distributing agency.

"Again, I have tried water pressure, as in the common gas holder; and I think in the dentists' room this plan would succeed well, if the preliminary expense were no obstacle. But taking all in all, the hand-ball bellows are as yet the most practical and most ready; they carry in the pocket, and one can go with them to the patient and commence anæsthesia at once—a great consideration. In many small operations, requiring only one or two strokes of the knife, the whole may be done painlessly, while the patient thinks that the preparations are merely being made—much, of course, to his gratification.

"Several suggestions for the improvement of the jets offer themselves for consideration; the fish-tail gas burner, the Argand burner, the conservatory water engine, and many other mechanical contrivances similar in kind will occur to every one as worthy of imitation, and as quickly as they can be made they will be produced and tested.

"*The Fluid to be used.*—I still continue to use absolute ether for operations, and now, as Mr. Robbins has produced an ether of specific gravity 0.720 of negative effect on the tissues, and having a boiling point of 92° Fahr., a better fluid can hardly be demanded. Many other fluids have been suggested by various readers of my original paper, viz., me-

thylic ether, amylene, monochloretted chloride of ethyle, pure chloric ether, nitrite of ethyle, a volatile hydrocarbon derived from the manufacture of portable gas, chloroform, rectified turpentine, and numerous compounds and mixtures. As regards these I may state that they have all been under my careful consideration, but that as yet none of them, taking their qualities all in all, are equal to absolute ether. Some are open to rejection at once from their boiling point being too high; others are unpleasant, and would not admit of being used in operations on the mouth or teeth; others cause irritation of skin; others in their pure state are so extremely volatile that they could not be kept in the surgery for any length of time—this is specially the case with methylic ether and nitrite of ethyle, both promising substitutes for ether; lastly, a body too volatile would somewhat affect the operator during the operation if it were diffused in the pure state. Nitrite of ethyle is open to this objection not so much as the nitrite of amyle would be, but to some extent.

“In time we may, perhaps, by experiment get a compound volatile mixture which, being as negative as absolute ether in its effect on the body, shall boil a few degrees lower.

“Before leaving this topic, let me state that the mere alteration or change of the volatile fluid used is no change of the principle of the present anæsthetic process. Ether itself is only a local anæsthetic on being employed according to this principle. This is important to be borne in mind, otherwise a principle may become confounded with a detail, and every fluid with a low boiling point and the other necessary physical qualities, as I have described them, for producing insensibility, will be dubbed a local anæsthetic. By a slip of the pen, indeed, this error was committed in the *Medical Times and Gazette* of last week, a short leading article having been headed ‘Kerosolene a Local Anæsthetic.’ Kerosolene—a body very impure, unpleasant, and of unsteady but low boiling point—when applied by my method acts like ether, because it resembles ether physically. But kerosolene is no anæsthetic *per se*, although it would serve as a substitution agent for one part of the anæsthetic process, in the same manner, and in none other, as an earthenware bottle would take the place of the graduated glass bottle in which the volatile liquid is commonly retained.

“Dr. F. D. Fletcher, of Southport, has suggested to me the employment of liquid carbonic gas, and, as will be seen by last week’s *Medical Times and Gazette*, Sir James Simpson has had carbonic acid in view for some years. I believe the first physiologist who actually tried to apply the reducing agency of carbonic acid for the production of anæsthesia was the late Dr. Snow. He went to great trouble and expense to experiment on the gas in the solid state, and he applied it in that state to his own skin. Singularly enough, the insensibility produced was slow and imperfect, but the worst feature was that a slough was always produced on the part where the acid had been applied. Snow, therefore, gave up the effort, convinced that carbonic acid in the solid form could never be made applicable in actual practice, and that if it could it would not be a safe agent.

“I myself moved for a time in a similar direction by using carbonic acid in the liquid form. Mr. Robbins supplied me with the gas reduced in a three-pint iron bottle under pressure. When the stop-cock was opened and the carbonic acid was liberated through a fine jet, an intense cold was produced; but I utterly failed in attaching a conveying tube that

would be applicable for operations. The pressure, in a word, was unmanageable, and for ordinary practice, dangerous. In one experiment, while the jet was being directed on the back of my hand, the nozzle of the tube became set free, and, being projected with violence, injured me severely. I, therefore, like Snow, gave up carbonic acid as a body that would not submit to guidance, and as impossible to use in surgical practice.

"We need not, fortunately, trouble ourselves on this subject. I have shown that by the dispersion of fluids of low boiling points we can get a degree of cold which answers the required purpose without employing fluids or gases under pressure. If we want more than absolute ether, chemistry can furnish us with fluids which boil even at below 70° Fahrenheit, which fluids, dispersed as vapor, would fill the purpose of carbonic acid with only one disadvantage—that of being difficult to keep in store during many months of the year.

"THE PRACTICE.—In effecting local anæsthesia by my process the surgeon, according to the nature of the case, may either produce entire blanching of the surface to be operated on, or may stop short of that extreme result, and only induce a superficial anæsthesia. In my first experiments, made with the ordinary ether of the shops, I employed the second form of anæsthesia alone, and even now when a mere puncture through the skin or mucous membrane is required, I still resort to this method, reserving the extreme action for cases where deep-seated parts have to be divided.

"For producing the deep anæsthesia with superficial whiteness it is necessary to use absolute ether, and to direct the spray in brisk current at a distance of about an inch from the part. To induce the less determinate condition the ether may be diluted. This may be done by mixing alcohol with the ether, or better still chloroform. Two mixtures of this kind are very useful; one contains six parts of ether and two of chloroform, the other seven of ether and one of chloroform. In using pure ether, or the mixture, differences of time are required. To cause insensibility with the simple fluid—ether—from fifteen to fifty seconds only are necessary. To produce insensibility by the mixture of ether and alcohol, or of ether and chloroform, from four to five minutes are demanded. The sensation felt by the patient also differs. When pure ether is used little if anything is felt until the moment when the part becomes white: then there is a sharp, pricking, burning sensation. When the compound or mixture is used, the sensation, very prolonged by comparison, is that of numbness and aching. On the whole, I have found patients generally prefer the more rapid procedure.

"The nature of the operation will, to a large extent, determine the method to be resorted to. For opening an abscess, for incising a small carbuncle, for tying a nævus, for removing very small tumors, for applying nitric acid, and for operations of a similar kind, the mixture of ether and alcohol, or of ether and chloroform, answers every requirement. I should myself also use the mixture in an operation for hernia, because the tissues would not be rendered hard, and the dissections could be carried on with delicacy. But for deeper operations, such as removal of the nail, of portions of bone, of fingers, and the like, the complete action of the anæsthesia requires to be brought into play. For teeth extraction the pure ether also answers best—it acts rapidly and deeply, and there is no great accumulation of fluid in the mouth. By practice, the two degrees

of action I have named may be obtained by the employment of ether alone: I mean, the degree of anæsthesia from the spray of absolute ether can be determined by the distance from the part at which the spray is directed: by removing the jet three inches from the part, a moderate effect is produced, nearly equivalent to the dilution of seven parts of ether with one of chloroform. The condition of the patient generally ought likewise to be considered. Aged and weak people become anæsthetic very readily, and for them the milder process is most applicable.

"I had intended this week to supply the particulars of experiments on a large number of fluids, simple and compound, which I have tested; but the inquiry is not so exhaustive as I could wish. The substances experimented with are numerous, and the analysis of their respective qualities is a task demanding judicial care. I reserve the subject, therefore, for my next chapter."—(*Med. Times and Gaz.*)

"Local Anæsthesia in Dental Operations. By FRANCIS McLEAN, JR., Dental Surgeon to the City of Dublin Hospital.—The following cases, in which dental operations were performed under the influence of 'Richardson's apparatus,' are, I think, of some interest at present, and they are therefore published rather with the view of recording the results of an experimental employment of the instrument in this branch of surgery than with any suggestion in view. The instrument has been employed with the best result in the minor operations of surgery, as reported by Dr. Glascott Symes in *The Medical Press and Circular*; but a natural impression exists that it is less applicable to tooth extraction than to other operations on account of the pain anticipated from the congealing process. The following cases, I think, prove that this objection to its use is not well founded, and that where the spray can be satisfactorily applied, it is an agent of great and lasting importance to the profession:

"*Case 1.*—A nervous man, aged thirty; second inferior molar, right side; pain most severe when applying the spray, which I did for about thirty seconds; on pushing the forceps down on the neck of the tooth nothing was felt, but when detaching the tooth from its connections with the socket (which required considerable force) the usual pain was experienced; in one second after the tooth was out no uneasiness whatever was complained of.

"*Case 2.*—A medical man; second inferior molar, right side; the surrounding parts in a high state of inflammation; patient had no discomfort when applying the spray, but was inclined to cough; the tooth was removed without requiring much force, and nothing was felt; in a few minutes after the tooth was out the pain was violent.

"*Case 3.*—A lady; never had a tooth extracted. I applied the spray for something less than a minute, and extracted the first left superior molar. Afterward she told me she suffered very little pain, and that the spray produced none. After some minutes the pain was violent for a short time.

"*Case 4.*—A stout female; first superior molar, left side, with a large cavity in it, and very firm. Spray applied for thirty seconds, which caused slight pain, and she describes the sensation during extraction as 'a slight touch;' some pain afterward on return of circulation; very little hæmorrhage.

"*Case 5.*—A young girl; stumps of a second inferior molar; tooth

broken in former operation; very unmanageable; the stumps low down. In this case it was impossible to apply the double jet, so tried the single one; the moment I applied the instrument to extract, the patient commenced struggling and crying out; with difficulty and pain one was removed.

"Case 6.—A medical student; second right superior bicuspid, had never lost any permanent tooth on that side; very slight pain when freezing; none at all on extraction or subsequently.

"Case 7.—A young man; second inferior molar, right side, very carious; application of cold slightly painful, but not nearly so bad as the removal of teeth on former occasions; no pain on applying the forceps, when unfortunately the tooth fractured, and it was necessary to remove the fangs separately, which I did after a good deal of pain. This same gentleman, for the benefit of the class, allowed me to extract a superior bicuspid which was carious, and states he felt no pain whatever either on freezing or extraction; he did not know when it was out.

"Case 8.—A medical student, very nervous man, second inferior molar, left side; could hardly bear me to touch it. On placing cotton wool in its cavity pain was intolerable for some minutes. He did not mind the cold of the spray after the first dash of it. When I was removing the tooth, he describes the feeling to be as of something pushing at it, but had no uneasiness.

"In the first case the pain, on application of the spray, was, I have no doubt, caused by the cold coming in immediate contact with the nerve of the tooth through the pulp cavity, which was exposed, and at the suggestion of my friend, Dr. Geoghegan, I first placed a small piece of cotton wool in the cavity of the tooth, and with beneficial results. The subsequent pain in the second and third cases, I believe to have been caused by the patient's taking warm water into the mouth before the frozen parts had time to come back to the normal temperature.

"The conclusions which I have myself arrived at are:

"1. That if the nerve be properly protected from immediate contact with the ether spray, the freezing process is attended with little, if any, discomfort.

"2. That the anæsthetic effect is complete whenever the spray can be properly applied, but that this essential cannot be satisfactorily attained whenever the operation occupies a longer period than about a minute. The apparatus is, therefore, only partially applicable to the removal of stumps.

"3. That the gradual restoration of the circulation in the gum causes no pain, but that the usual wash of tepid water is objectionable as causing too sudden a change of temperature.

"4. That as far as my short experience extends, there is no danger of the sloughing of the gum, which has followed the use of the ordinary congelation apparatus.

"I have this morning seen four of the cases operated on in the hospital by me last Thursday, and am glad to say there has been no uneasiness since, so that I do not apprehend sloughing of the gum. The instrument I have used in the above cases was Dr. Richardson's anæsthetic spray-producer, supplied to me by Messrs. Fannin & Co., and anhydrous ether.

"I have recorded all the cases just as they occurred, not confining myself to the successful ones, that the readers of *The Medical Press and Circular* may judge for themselves."

"The Ether Spray-Producer in Dental Practice. By HENRY SEWILL.—There are few operations in minor surgery in which Dr. Richardson's recent discovery promises to be of greater utility than in the extraction of teeth. Decayed teeth have a very important influence on the general health, and indeed as a cause of disease I am sure they are frequently overlooked. For example, patients whose mouths contain chronic abscesses and sensitive teeth, which contaminate the food and prevent mastication, can hardly be cured of their dyspepsia by medicines or regimen. Such patients, as a rule, dread extremely the extraction of their teeth, and are equally afraid of chloroform, which is frequently inadmissible, and never entirely without danger. It is the same in that very common disease, facial neuralgia, of which the great majority of cases are due to diseased teeth.

"I have had charge of the dental department of St. Mary's Hospital during the temporary absence of Mr. Sercombe, and with his permission I have used Dr. Richardson's apparatus in all the suitable cases that have presented themselves during the last few weeks. From the experiments I have made, I believe that, since the teeth are, in comparison with the other tissues of the body, good conductors of heat, and since they are attached to structures which are not highly vascular, they are very favorable for the application of this process, which depends for its anæsthetic effect upon the rapid withdrawal of heat from the part. I have therefore no doubt of the ultimate modification of the apparatus so as to insure success in every case. At present, however, it is only applicable to the incisors, bicuspid, and canines. In operating on the molars, the accumulation of saliva, the movements of the tongue and of the cheek, together with the restlessness of the patient, owing to the entry of ether into the throat, render the continuous application of the spray seldom possible.

"What is wanted is an apparatus that shall prevent the tongue and cheek from interfering with the spray, while at the same time it prevents the closure of the mouth, and by fixing the lower jaw, enables the patient to swallow his saliva. Toward the accomplishment of these ends I might make some suggestions. I prefer, however, to wait until I have increased my experience and compared it with that of others.

"The local irritation which sometimes follows Dr. Richardson's method, I have observed; but I believe it may be much mitigated, if not prevented, by bathing the part with cold water, and applying the spray before reaction ensues, the accession of extreme cold being thus rendered more gradual."—(*Lancet*.)

"Rhigolene, a Pretroleum Naphtha for producing Anæsthesia by Freezing.*—[Read before the Boston Society for Medical Improvement, April 9th, 1866,† and communicated for the *Boston Medical and Surgical Journal*.] By HENRY J. BIGELOW, M.D., Professor of Surgery in the Massachusetts Medical College. The above name is proposed as convenient to designate a petroleum naphtha boiling at 70° F., one of the most volatile liquids obtained by the distillation of petroleum, and which has been applied to the production of cold by evaporation. It is a

* Rhigolene, from *γρυος*, extreme cold, to which is added, the euphonious termination of most of the other petroleum naphthas.

† About three weeks after my first experiments with rhigolene, I first learned that Prof. Simpson, of Edinburgh, had lately employed "kerosolene" for this purpose.

hydrocarbon, wholly destitute of oxygen, and is the lightest of all known liquids, having a specific gravity of 0.625. It has been shown that petroleum, vaporized and carefully condensed at different temperatures, offers a regular series of products which present more material differences than that of their degree of volatility, and that the present product is probably a combination of some of the known products of petroleum with those volatile and gaseous ones not yet fully examined, and to which this fluid owes its great volatility. A few of these combinations are already known in trade, as benzolene, kerosene, kerosolene, gasolene, etc., all of them naphthas, but varying with different manufacturers. I procured, in 1861, a quantity of kerosolene of four different densities, and found the lightest of them, the boiling point of which was about 90° , to be an efficient anæsthetic by inhalation.* When it was learned here that Mr. Richardson, of London, had produced a useful anæsthesia by freezing through the agency of ether vapor, reducing the temperature to 6° below zero, F., it occurred to me that a very volatile product of petroleum might be more sure to congeal the tissues, besides being far less expensive, than ether. Mr. Merrill having, at my request, manufactured a liquid of which the boiling point was 70° F., it proved that the mercury was easily depressed by this agent to 19° below zero, and that the skin could be with certainty frozen hard in five or ten seconds. A lower temperature might doubtless be produced, were it not for the ice which surrounds the bulb of the thermometer. This result may be approximately effected by the common and familiar 'spray-producer,' the concentric tubes of Mr. Richardson not being absolutely necessary to congeal the tissues with the rhigolene, as in his experiments with common ether. I have for convenience used a glass phial, through the cork of which passes a metal tube for the fluid, the air-tube being outside, and bent at its extremity so as to meet the fluid-tube at right angles, at some distance from the neck of the bottle. Air is not admitted to the bottle, as in Mr. Richardson's apparatus, the vapor of the rhigolene generated by the warmth of the hand applied externally being sufficient to prevent a vacuum and to insure its free delivery; 15° below zero is easily produced by this apparatus. The bottle, when not in use, should be kept tightly corked, a precaution by no means superfluous, as the liquid readily loses its more volatile parts by evaporation, leaving a denser and consequently less efficient residue. In this, and in several more expensive forms of apparatus in metal, both with and without the concentric tubes, I have found the sizes of 72 and 78 of Stubbs's steel wire gauge to work well for the air and fluid orifices respectively; and it may be added that metal points reduced to sharp edges are preferable to glass, which, by its non-conducting properties, allows the orifices to become obstructed by frozen aqueous vapor.

"Freezing by rhigolene is far more sure than by ether, as suggested by Mr. Richardson, inasmuch as common ether, boiling only at about 96° instead of 70° , often fails to produce an adequate degree of cold. The rhigolene is more convenient and more easily controlled than the freezing

* An account of these experiments may be found in this journal, July 11th, 1861. Reference is made to them in a paper "On the most Volatile Constituents of American Petroleum," by Edmund Ronalds, Ph.D., in the Journal of the Chemical Society, London, February, 1865. Mr. Ronalds there states that "the most volatile liquid obtained by collecting the first runnings from the stills employed in the process of refining petroleum has a specific gravity of 0.666." He had also received a specimen of "kerosolene" from Prof. Simpson, of Edinburgh, at 0.633. It will be observed that the rhigolene has a specific gravity of 0.625.

mixtures hitherto employed. Being quick in its action, inexpensive and comparatively odorless, it will supersede general or local anæsthesia by ether or chloroform for small operations and in private houses. The opening of felons and other abscesses, the removal of small tumors, small incisions, excisions, and evulsions, and perhaps the extraction of teeth, may be thus effected with admirable ease and certainty; and for these purposes surgeons will use it, as also, perhaps, for the relief of neuralgia, chronic rheumatism, etc., and as a styptic, and for the destruction by freezing of erectile and other growths. But for large operations it is obviously less convenient than general anæsthesia, and will never supersede it. Applied to the skin, a first degree of congelation is evanescent; if protracted longer, it is followed by redness and desquamation, which may be possibly averted by the local bleeding of an incision; but if continued or used on a large scale, the dangers of frost-bite and mortification must be imminent.

"It may be superfluous to add that both the liquid and the vapor of rhigolene are highly inflammable." —

"*Galvanocautery in Dentistry.*—The *Gaz. Hebdomadaire* (1865, No. 16) reviews a work on this subject by DR. J. BRUCK (*Die Galvanokaustik in der zahnaerztlichen Praxis*, Leipzig, 1864), and offers the following analysis of its contents:

"The author, having given a detailed description of the galvanocautic apparatus which he uses, deals of the instruments of variable form which the different operations require.

"These are: 1. Straight galvanocauteries, *i.e.* platinum wires half an inch in length, for the cauterization of teeth of a single root. 2. Curved cauteries for the destruction of the dental pulp laid bare, and for the cauterization of teeth with more than one root. 3. Wires, furnished at their ends with a button, more or less flattened, for the cauterization of larger surfaces. 4. Spiral cauteries, to desiccate carious dental cavities. 5. Knives, made of thin platinum wire, straight, curved, blunt or pointed, or falciform, to extirpate constricted (*incarcérées*) growths of the gums. 6. The cutting loop, for the ligation and ablation of fungous growths seated upon the gums.

"The author, in explaining the advantages of the new process, insists, above all, on the equable and intense heat which it produces, and on the facility of regulating the latter by means of those commuting lids (*convercles commutateurs*) with which Middeldorpf has so ingeniously furnished his apparatus. Thus it is possible, where only a cutting agency is required, to reduce the current to the force of one element, so that the cautery only becomes red hot, while the prompt destruction of parts laid bare would demand the employment of two elements (the platinum wire at a white heat).

"All these instruments can, because of their dimensions, penetrate everywhere; they carry with them not only this—we may say intelligent—heat, but also the light illuminating the parts to be operated upon. The heat is produced only at the point of application and at the desired moment, and the instrument is cold when drawn out—an immense advantage, considering how often, in following the older methods, one had to touch the adjacent parts in this class of operations.

"The cutting loop, finally, destroys all excrescences and polypous vegetations with a pedunculated base, and in all situations accessible to the knife.

“The operation lasts but a few seconds; it is painless, and without hæmorrhage.

“The author does not waste time in comparing the new method with the old ones. In applying the red-hot iron, the heat is rapidly lost, the soft parts are burned, and the patients alarmed. The potential cautery is very unreliable, easily produces periostitis, and is always injurious to the enamel of the teeth. The torsion of the nerves, lastly, is rather an act of barbarism than a method of operation.

“Galvanocautery is applied with certain success. A. To the osseous parts of either jaw: 1. To teeth of a single or more roots. 2. To teeth deprived of their crowns, and to aching teeth which do not admit of being filled. 3. To the replacement of simple teeth, when the nerves have been laid bare. 4. To teeth broken off in extracting, with shreds of pulp or nerves laid bare. (It is in this case, above all, that galvanocautery has no equal among the other methods). 5. For subduing the sensibility of teeth filed or worn. 6. For converting moist caries into the dry. 7. Against caries of the jaw. 8. To arrest hæmorrhages.

“B. To the soft parts: 1. To extirpate pedunculated epulis. 2. To cause sloughing in epulis of large base. 3. For the destruction of polypous vegetations. 4. For that of constricted excrescences of the gums. 5. To operate for ranula. (M. Amussat has already, in 1853, performed this operation with entire success.) 6. To destroy the alveolo-dental membrane denuded at the neck. 7. Against fistulæ of the teeth. 8. Against old cases of parulis and fistulæ of the gums. 9. Against hypertrophy and chronic congestion of the alveolo-dental membrane.

“The author finally adds to this brief exposition of the action of the electric cautery many practical remarks, of which the following is a résumé:

“Galvanocautery, above all, offers the great advantage of economizing vitality, and of enriching conservative surgery, consequently, by a valuable agent.

“Toothache, produced by nerves being denuded, is always cured by this treatment, and the same success attends in cases of periodic toothache.

“To deaden the sensitiveness of teeth which have been filed or worn, the author makes use of various cauteries with buttons and thin cauteries for the interstices. He employs spiral cauteries to desiccate the dental cavities before plugging with gold.

“He arrests bleeding from the gums by cauteries with buttons heated to redness, and hæmorrhage from the alveoli after extraction by the curved or straight cautery.

“The alveolo-dental membrane, laid open by atrophy of the gums or resorption of the alveolar margin, loses its sensitiveness when the galvanocautery is laid around the neck and placed in contact with the gums.

“The pain in milk teeth, with denuded pulp, yields readily to the new cautery. Epulis has been cured by the cutting loop, or by puncture and consequent sloughing. A falciform knife, heated to redness, suffices for the removal of lobular and nodular growths. Hypertrophy and induration of the alveolo-dental membrane have disappeared under the influence of repeated punctures. Chronic parulis, and the fistulæ of the gums resulting from it, have been made to granulate, and cured with facility.”—*(St. Louis Medical and Surgical Journ.)*

“Submaxillary Abscess connected with Disease of the Lower Jaw. Four Cases (under the care of MR. NUNN), Middlesex Hospital.—Case 1.—W. B——, aged fifty-two, admitted Oct. 24th, 1865, with painful swelling below the jaw on the right side. The swelling had very much the appearance of phlegmonous inflammation of the cervical fascia—a not uncommon and a most painful disease. The patient was a stableman, and not especially exposed to weather.

“Oct. 26th.—Mr. Nunn opened an abscess rather deeply seated—that is to say, below the cervical fascia.

“Nov. 2d.—The diffused inflammatory action has subsided, but there is no disposition toward resolution. The mouth was inspected, and a loose molar was found in the lower jaw of the affected side. This was removed by Mr. Thompson (a pupil of the Dental Hospital attending surgical practice), he having expressed his belief that the tooth, being necrosed, was the cause of the abscess.

“10th.—The patient was discharged well, healing of the abscess having commenced directly on the removal of the dead tooth.

“Case 2.—E. W——, aged forty-seven, admitted June 8th, 1863, on the recommendation of Dr. Ayling, of Great Portland Street, under whose care she had previously been. ‘There is a sinus leading from the submaxillary region upward; the probe can be passed so as to be felt beneath the mucous membrane of the floor of the mouth, but not through any canal in the maxilla to the root of a tooth.’ Mr. Nunn made an incision along the maxilla of sufficient length to allow him to introduce his finger, and ascertain whether or not dead bone existed. None was discoverable, and after the subsidence of the inflammation excited by the operation the sinus continued nearly as before. The only molar remaining was extracted as the possible source of the mischief; but still the sinus remained, and the patient was discharged, after some weeks’ stay in the hospital, very much as when admitted.

“Some four months afterward she reported herself well, having used some simple external application.

“There can be but little doubt that the molar which was removed, and which proved to have been a denuded fang, was the primary cause of the abscess, and also of the persistence of the sinus, notwithstanding the circumstance of the want of immediate improvement after the removal of the dead tooth.

“Case 3.—R. B——, admitted Jan. 4th, 1866, on the recommendation of Dr. Slight, of Brewer Street, under whose care he had previously been, with acute inflammation of the lower jaw. ‘There is considerable constitutional disturbance; sleeplessness from pain; the right side of the lower jaw is tumid, tense, and tender; two of the molars are necrosed and loose, and there is a purulent discharge exuding around the necks of these teeth from the alveoli, and an opening in the submaxillary region leads to dead bone.’ The patient, aged twenty-eight, is a lapidary; has not been specially exposed to the fumes of phosphorus, but acknowledges that in lighting his pipe with lucifer matches he does not wait till the phosphorous material of the match is consumed.

“Jan. 10th.—Mr. Nunn removed the loose tooth, and, enlarging the sinus below the jaw, removed about one-third of the horizontal ramus of the inferior maxilla. Lotion of chloride of zinc (one grain in one ounce) to be freely used.

“25th.—Made an out-patient, the swelling having subsided.

"Feb. 8th.—Nearly well.

"The necrosis in this case involved not only the alveolar border, but the entire thickness of the bone. The disease was rapid in its progress, a month only having elapsed since the first symptom—namely, local pain. It is very probable that the phosphorous vapor from the lucifers employed in lighting his pipe was the exciting cause of the mischief.

"Case 4.—Susan H——, aged twenty-three, admitted July 25th, 1865. 'There are several submaxillary sinuses, with considerable induration and diffused swelling of the left side of the neck; she cannot open her mouth, and of course cannot take solid food; she suffers great pain; her breath is very offensive. She has not menstruated during the past two months.' At the end of May last, while at Brighton (in service as kitchen-maid), she felt so much pain in the face that she could not sleep; swelling below the jaw followed, and suppuration took place. 'Three lower incisors are loose.'

"August 1st.—Mr. Nunn explored the sinuses, but did not find that the body of the inferior maxilla was diseased, the necrosis being confined to the alveolar processes. The loose teeth were removed.

"11th.—The remaining loose teeth were removed. At subsequent dates the whole number of the teeth in the lower jaw were required to be taken away, the entire alveolar border having perished.

"The separation of the septa of the alveoli was very tedious, and the patient was not discharged until Dec. 19th, when she was perfectly well.

"A gargle containing one grain of chloride of zinc to an ounce of water was freely used. This gargle Mr. Nunn strongly recommends as the most valuable detergent for the mouth we possess; its effect in removing the fetor of the breath he states to be almost immediate. Chloride of zinc forms with albumen a double chloride of zinc and albumen, which is practically indecomposable. The fetor of inflamed buccal mucous membrane is probably due to the decomposition of the albumen of the buccal mucus together with the ptialine."—(*Lancet.*)

"*Congenital Cleft Palate; Operation of Staphyloraphy.* (Under the care of Sir William Fergusson, Hospital for Diseases of the Throat.) Reported by MR. WASDALE WATSON.—Jessie R., aged twenty-three, from Glengarry, applied at the hospital January 4th, 1866, very desirous to submit to an operation for the cure of a congenital cleft palate. The articulation was of the ordinary imperfect nasal character, and in swallowing liquids a portion was occasionally violently ejected through the nose. The malformation affected the whole of the soft palate, but not the osseous structures. Sir William Fergusson performed the operation in his usual way on January 11th, first dividing the levator-palati, palatopharyngei, and palato-glossi muscles; secondly, paring the edges of the fissure from above downward; and, thirdly, bringing the edges together with sutures, passed on each side from before backward. There was very slight hæmorrhage. The case progressed most favorably.

"On the 15th the sutures were removed, and a week later the patient was discharged cured. At the time of her discharge the palate presented no trace of the defect beyond the cicatrices of the sutures."—(*Med. Times and Gaz.*)

"*A Simple Interdental Splint.* By JAMES BOLTON, M.D., of Richmond, Va.—The interdental splint described by Dr. Covey, in the Feb-

ruary number of this journal, appears to me to approximate perfection as nearly as we are likely to reach. The means of preparing it, however, are not always at hand. The splint hereafter described has the advantage of greater simplicity, of fulfilling the indications in a similar, though less perfect manner, and may be always within reach of the surgeon. A case of gunshot wound of the lower jaw came under my care during the late war. The ball struck the right side of the lower jaw, just anteriorly to the first molar tooth. Some pieces of bone had exfoliated, and it was probable that other pieces would follow them.

"I took a piece of gutta-percha about an inch in thickness, and about two inches in length. I then worked it in hot water, so as to form flanges on each side, about one-quarter of an inch in height. The piece was shaped into the form of a letter 'H,' with a very thick cross or connecting piece; or it may be compared to a 'T' or 'H' iron bar of a railroad, laid on its side. Having softened by heat the upper and lower surfaces of the gutta-percha splint, I placed it between the teeth of the upper and lower jaw, pressing the teeth into it, so as to form sufficiently deep indentations. The flanges lapped over the upper and lower teeth on their outer and inner surfaces, and were gently pressed against them. Holding the parts in position accurately for a short time, I removed the gutta-percha and threw it into cold water. I then placed it again between the teeth. On the outside of the jaw, I moulded a piece of gutta-percha plate about one-sixth of an inch in thickness. Through this plate I cut an opening of sufficient size to allow a free exit of pus, and of pieces of exfoliated bone. Over all this, I placed a four-tailed bandage, which held everything in place very firmly. The patient left the city, and I did not see him again until the expiration of about eight months. A careful examination, at this period, revealed a most complete and satisfactory cure. The ends of the bones had united firmly, and were most accurately in position; there was no deformity, and the functions of the jaw were admirably restored.

"It will be perceived, that the teeth fitting accurately into the indentations upon the surface of the gutta-percha, prevented the motion of the fragments, and that this was still further accomplished by the flanges, which were moulded upon the vertical surfaces of the teeth, and were pressed into their interstices. The upper and lower teeth, being kept apart a distance of about a half inch, permitted the free use of liquid food. The patient was able occasionally to remove the whole apparatus, to cleanse it and the mouth thoroughly, and then to replace it."—(*Richmond Med. Journ.*)

Health.—The following judicious remarks on this subject occur in a review of DR. A. BRIERRE DE BOISMONT'S work "On Suicide and Suicidal Madness," in the *Med. Times and Gaz.*: "The man who is most healthy is he whose balance of health is most perfect, whose mind is not in advance of his body, whose judgment is not overruled by his imagination, nor paralyzed by his passions. It has been said that civilization and education sometimes prove more a curse than a blessing; but this can only be because the education is partial and imperfect, so that the just balance is destroyed. That education is the most perfect which cultivates equally the physical, intellectual, and moral attributes of our nature. But how seldom is this education to be obtained! The body is cared for, and the mind is neglected. Æsthetic enjoyment is searched for every-

where, while the reasoning faculties are allowed to decay; or we bow down and worship our intellect, and impiously deny our God.

"Men of small minds still wish to shine. They select one faculty and educate it at the expense of the others. They are men of one idea; bigots, intellectual monsters, who bear the same relation to a perfect man as a blacksmith with brawny biceps and shrunken calf bears to the Apollo Belvedere. The danger in this nineteenth century of ours is, that the intellect should be overstimulated. Realism has the advantage over idealism. There is very little danger that we shall go forth to spill our blood, fighting against windmills, to do honor to some Dulcinea whose charms and graces are entirely supposititious; but there is danger, or if no immediate danger still there is a tendency, to sit down coldly and count up the cost.

Whether 'tis nobler in the mind to suffer
The slings and arrows of outrageous fortune,
Or to take arms against a sea of troubles,
And by opposing, end them.

"The safeguard against that sane form of self-destruction, which arises because a man doubts whether it is worth his while to live, is found in the consciousness that there is a nobility in suffering, if suffering come in the way of duty, and that every one of us has his place and duty fixed here by One wiser than himself."

"*Linoleum Manufacture.*—The manufacture of this new and interesting material, which threatens to rival the india-rubber trade in the multiplicity and utility of its applications, is based on the invention of Mr. Frederick Walton, whose patents are now worked by the Linoleum Manufacturing Company, at Staines, and 45 Cannon Street, West. The word linoleum is derived from *linus* (linseed), and *oleum* (oil), from which products the new substance is made. The linseed oil of commerce is solidified or 'oxydized' by the absorption of oxygen, by which process it becomes changed into a semi-resinous substance. It is then combined at a strong heat with resinous gums and other ingredients, and the substance thus obtained has all the appearance and many of the properties of india-rubber.

"Those who are conversant with the uses of the pliable elastic gums readily perceive the wide field of usefulness that any material possessing such properties is designed to occupy, more especially as the price of the new substance is much lower than india-rubber or gutta-percha. Linoleum can also be dissolved into a varnish or cement in the same manner as india-rubber, and in this form can be employed in the manufacture of material for water-proof clothing. As a varnish or paint for protecting iron or wood, or for coating ships' bottoms, it is said to be admirably adapted, as it dries rapidly, in fifteen or twenty minutes, and adheres with singular tenacity. As a cement for uniting substances, such as wood with iron, or wood with wood, it is very effective, and has similar properties to the marine glue made from india-rubber and shellac. Singularly enough, linoleum can also be vulcanized or hardened by exposure to heat. By this means it is made as hard as the hardest woods, and rendered capable of receiving a high polish without the aid of varnish or any other extraneous substance. In this condition it can be filed, planed, or turned as easily as wood, and employed in many of the various ways for which wood is used. Or it can be moulded in heated dies to any desired form, as, for

example, flax-spinners' bosses, sheaves for ships' blocks, surgical-instrument handles, picture frames, mouldings, veneers to imitate marble, ivory, ebony and other woods. Combined with emery, it forms a grinding wheel having extraordinary cutting or abrasive power. Very dissimilar are some of the uses to which the new substance can be applied. Carriage-aprons, cart-sheeting, sail-covers, reticules, tarpauling, printers' blankets, gas pipes, telegraph supports, washable felt carpets, table covers, paints for carriages or for printing floor-cloth, or enamels of any color for enameling papier-mache or metals. These are only some of the many uses to which linoleum may be applied.

"The manufacture has, however, hitherto been chiefly confined to the development of the floor-cloth trade, for which the new material has proved itself well adapted. Linoleum floor-cloth is produced by combining the linoleum with ground or powdered cork, which is rolled on to a stout canvas, the back of the canvas being afterward water-proofed with a cement or varnish made from the solidified or oxidized oil before referred to. The combined fabric so manufactured is then printed by means of blocks in every variety of pattern, in the ordinary way. The floor-cloth thus produced is pliable, and comparatively noiseless to walk upon. It washes well, preserves its color, and can be rolled up like any ordinary carpet. Besides being very durable—the component parts being almost indestructible except by fire—it will not decompose by heat or exposure to the sun or air, as is the case with india-rubber. It is therefore better adapted than that substance for hot climates. To the chemist, engineer, and manufacturer, linoleum offers quite a new substance for experiment, and no doubt, as it becomes better known, the various uses to which it may be applied will be more fully developed and appreciated. The patentees, we understand, are prepared to grant licenses for the manufacture of some of its applications, such as varnishes, cements, and the hard compounds above mentioned. Important results may therefore follow the introduction of this new and valuable substance."—(*Mechanics' Magazine and Journal of Applied Chemistry*.)

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"New Cement.—A cement, capable of uniting into a solid mass stones, pebbles, etc., so as to form artificial pudding-stone, conglomerates, etc., of extraordinary strength and tenacity, impervious to moisture, and capable of being moulded into statues, bas-reliefs, etc., may be made by finely triturating iron sponge, and mixing it with sand, which has been moistened with slightly acidulated water. The iron is oxidized at the expense of the water: and the silex forms with the oxide, silicate of iron, which possesses a very great tenacity, and is not affected by atmospheric changes, nor even by acid or alkaline liquids at a boiling temperature."—(*Intellectual Observer*.)

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Melting Apparatus.—"M. PERROTT has communicated to the Academy of Sciences at Paris an account of his apparatus for producing very high temperature by means of coal gas mixed with atmospheric air. He unites a certain number of Bunsen's burners, so that their flames may form a single band of flame without penetrating each other, and thus obtains a column of heated gas, of intense calorific power, in such a position that its energy may be readily controlled. Into this he introduces air in such a manner that as little heat as possible shall be lost. With an apparatus consuming two cubic meters of gas per hour, he states that he has been able to

melt 670 grammes of silver, and in 30 minutes to melt and run out into bars a kilogramme of copper.”—(*Sci. Amer.*)

Heat-Conducting Properties of Alloys.—The *London Engineer* states that “alloys in which the preponderating metal is the worse conductor of heat present the curious result that they conduct heat as if they did not contain a particle of the better conductor; the conducting power of such alloys being the same as if the bar used in the experiment were entirely composed of the worse conducting metal.”

“Powder to clean Silver.—Take powdered cream tartar 2 ounces, fine chalk 4 ounces, alum 1 ounce; mix together these three substances; rub the silver with the mixture reduced to paste with a little water; wash it well and dry it. Old silver thus treated assumes the appearance of new.”—(*Journ. of Applied Chem.*)

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Proceedings of the American Pharmaceutical Association at the Thirteenth Annual Meeting, held in Boston, Mass., September, 1865, with the Constitution and Roll of Members. 8vo., pp. 260. From the Secretary.

The contents of this volume illustrate the value of class organization in advancing knowledge. The work comprises, besides the ordinary business transactions, special reports, volunteer essays, and discussions on various subjects of general as well as pharmaceutical interest, with sketches of new or approved apparatus applicable to the laboratory. Among other creditable articles in the constitution of this association, is one providing for a committee on scientific queries to present “near the close of each annual meeting a proper number of questions of scientific and practical interest, the answer to which may advance the interests of pharmacy, and procure the acceptance of many such questions for investigation as may be practicable, and report before the succeeding annual meeting.” This rule is worthy of adoption in all other scientific societies, as it directly tends to encourage research by presenting for investigation subjects of special interest in accordance with the intellectual spontaneities of their members, the acceptance being voluntary and not obligatory, and therefore more certain of securing due consideration and suitable response.

Biographical Sketches of Distinguished New York Surgeons. By SAMUEL W. FRANCIS, A.M., M.D., Fellow of the New York Academy of Medicine. Reprinted from the *Medical and Surgical Reporter*. New York: John Bradburn, 1866.

Whatever may be thought of the propriety of publishing biographies of living members of the medical profession, certain it is there is always much interest to know something of the personal history of individuals of note in that as in every other department of life. The work before us contains a brief record of the lives of sixteen surgeons of New York, which, although more exclusively of local, is yet of considerable general interest in consequence of the extended professional reputation of those delineated in its pages. It is written in a pleasant manner, and issued in a plain but neat style.

THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, JUNE, 1866.

No. 11.

ORIGINAL COMMUNICATIONS.

PREPARATION OF NITROUS OXIDE.

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WHATEVER be the particular form of the apparatus employed in the manufacture of nitrous oxide, it must always consist of three essential parts: the generator, purifier, and receiver of the gas.

1. *Generator*.—The simplest form of generator is a plain glass retort. Those with glass stoppers are objectionable on several accounts; they are more costly than plain ones, it is difficult to make the opening impermeable to gas, and the dropping of fragments of fused nitrate of ammonia directly upon the thin bottom of the retort is apt to fracture it. The generator should be of glass, on account of the formation of vapors of nitric acid along with the nitrous oxide. These acid vapors would corrode a metallic vessel, and be themselves converted into deleterious fumes of nitric oxide. A retort of the capacity of one pint affords ample room for the safe decomposition of three-quarters of a pound of the nitrate, either fused or crystallized: one containing a quart for any amount under two pounds.

In order to obviate the great liability to fracture, which attends the direct application of flame to the bottom of the retort, and in order to communicate the heat gradually and equably, the retort should be set in a sand-bath. And it is well also to cover the neck of the retort with five or six square inches of sheet zinc or iron, bent into a cap, for the same reason.

In selecting a retort, one should be chosen with a beak of not less than an inch in diameter. If the beak has been drawn out by the glass-blower to a smaller bore than the above, it should be broken off at the proper point. This is effected by filing around a portion of the circumference of the beak with a sharp-cornered file, and administering a decided rap.

The sharp edge of fracture should afterward be rounded by fusion in the flame of a lamp. When the beak has the above width, the nitrate drops in easily and glides gently down into the bottom of the retort.

The retort may be connected with the purifier in two ways. A cork is fitted tightly into the beak of the retort, and pierced with a glass tube. This is the simplest method, and would probably be the best, if it were easy to get and retain a close fit with cork. But this is difficult, and especially so when the opening of the beak widens inward. It is better, therefore, to obtain about a foot of rubber tubing, which is large enough to stretch over the opening of the beak. This large tube may be connected with the smaller one, which passes to the purifier, by an adapter. The latter is easily made by drawing out one end of a glass tube, which has about the same diameter as the opening of the beak.

2. *Purifier*.—The gas is washed in one or more quart bottles. Through the cork, an ingress-tube is passed, reaching nearly to the bottom of the vessel, and an exit-tube which stops short of the washing-liquid. If the gas is collected in a bell over water, one wash-bottle is sufficient; if in a rubber bag, two had better be employed.

3. *Receiver*.—The receiver ordinarily has a capacity of thirty or forty gallons. India-rubber bags are generally employed, but they are not as serviceable perhaps as a floating bell. They are liable to decay from the action of acid vapors; and the mellowing of the gas when allowed to stand in them for a day or more, is probably due to the absorption of acid by the rubber, and is obtained at the expense of the bag.

A cylindrical bell, of galvanized iron, two feet six inches in height, and eighteen inches in diameter, contains about thirty-three gallons, and is of convenient shape and dimensions. The top of the bell is a cone of about two inches in height, and is terminated at its vertex by a stop-cock. Such a bell weighs about sixteen pounds. It is counterpoised by three nine-pound weights, fastened at the end of as many fixed pulleys. The wheels of the pulleys are arranged on top of three standards, which are riveted at equal distances around the side of the tank, and rise two feet seven inches above it.

When fresh water is run into the tank, it absorbs, at common temperatures, about its own volume of laughing gas. The water loses its gas very slowly, however, and the rate of subsequent absorption is correspondingly slow. This form of gasometer has the very great advantage that it finishes the purification of the gas. It is a matter of question, whether gas which has been allowed to stand for a number of hours over water in such a gasometer would not be pure enough for inhalation without the aid of a single wash-bottle; certainly, one wash-bottle for conversion of whatever nitric oxide, which has been formed, into nitrous oxide, is sufficient.

Materials.—The crystallized appears to answer as well as the fused

nitrate of ammonia, and is from fifteen to twenty-five cents per pound less in price. A pound of either may be safely heated to ebullition in twenty minutes. As the bulk of material diminishes, the boiling correspondingly increases, and must be restrained by cautious regulation of the temperature. If, as sometimes occurs, the steam which arises from the decomposition of the nitrate of ammonia is formed in alarming quantities, the flame should not be entirely withdrawn. It should be lowered, but not to such a point that bubbles of gas cease to arise from the ingress-tube of the wash-bottle. Otherwise, an unexpected condensation of steam in the retort will create a vacuum, into which the contents of the wash-bottle will be projected by atmospheric pressure. The retort is disconnected with the wash-bottle at the adapter, and this is done immediately on withdrawal of the heat. And the boiling is not pushed to dryness, which would be fatal to the retort.

Each particle of the nitrate of ammonia, when heated to a temperature of about 480° , is decomposed into two particles of nitrous oxide and four of water. In a pound therefore of nitrate there would be 28.8 gallons of gas, and a little over five ounces of water. This is not quite true in practice, since the temperature cannot be regulated with sufficient accuracy, and various amounts of nitric oxide and hyponitric and nitric acids are formed along with the laughing gas.

The first wash-bottle should contain about a pint of saturated solution of protosulphate of iron, and a small quantity of free sulphuric acid. The nitric oxide yields up one of its two equivalents of oxygen to the iron, which is converted into sesquioxide, and passes out of the wash-bottle as nitrous oxide.

The free sulphuric acid is to facilitate the conversion of the sesquioxide of iron into persulphate.

If a second wash-bottle is used, it is filled with a pint of solution of potash or soda to take up the acid vapors. It is well to allow the gas to stand for one or more hours over the surface of the water before inhalation.

My thanks are due to Mr. Walter Jackson and Professor Ellis for their kind assistance in the preparation of this article.

EXPANSION OF PLASTER; METHODS USED AS REMEDIES; A NEW REMEDY.

BY T. D. CHAMBERLIN.

Read before the Central Massachusetts Dental Association, Worcester, April 9, 1866.

It is probable that a large majority of dentists take their impressions, for whole sets at least, in plaster; and that this substance is universally used for making casts or models of the mouth. It follows, then, other

things being equal, that the success or failure of atmospheric pressure or suction plates, depends upon the properties and practical working of calcined plaster. So well adapted has this material proved itself for facilitating various processes in mechanical dentistry, that the more general opinion among the profession in regard to it seems to be that a good plaster cast, taken from a so-called perfect plaster impression, is a perfect model of the part from which the impression was taken; or that it is sufficiently accurate for all practical purposes. Assuming this to be true, many of the early advocates of rubber work were constantly assuring us that the rubber plate being vulcanized directly on the plaster model, you will always be sure of a perfectly fitting plate—always sure of a good suction. Now, I would not detract from the real merits of any system; and that rubber work has great merit, it were senseless to deny. No system or method of practice can, with any reason, be held responsible for the ignorance, accidents, and faulty manipulations of those who practice it. Nevertheless, all due allowance being made for these things, do we not, at times, have as much trouble in obtaining good suction by the vulcanite as by some other methods of practice? If you answer in the negative, I reply, *you* are more fortunate than some men of my acquaintance; if, perchance, in the affirmative, where, then, I ask, is the trouble?

In considering this subject, I put wholly aside a very small class of extreme and exceptional cases, with which, for any reason, satisfactory success may be impossible. I also confine myself within the limits of my own observation and experience, which may or may not represent the experience of others.

Finding, more than a year ago, that I was not meeting with my usual success in obtaining good suction, and that I had some cases of rubber work on my hands, with which, after repeated efforts, I had met with only indifferent success, I felt compelled to investigate with great care and thoroughness, that I might, if possible, discover the cause of my failures. I reasoned as follows: as I insert teeth on vulcanite base, I see no reason why a perfectly fitting plate may not be obtained, unless the plaster used for the impression and model so expands in hardening, or the model be so changed during the process of vulcanization, as to change the result from what it otherwise would be; for if neither of these changes take place, then a plate fitted to the model must be a perfect adaptation to the part of which the plaster cast was a correct model.*

* I presume it will be said that although this reasoning may be plausible as a matter of theory, yet it cannot be realized in practice; that allowance must be made for the difference in the texture of the different portions of the palatal arch, one part being firm and hard, while other portions are often soft and spongy. I am aware of all this; yet I am of the opinion that if we ever get so that we can work materials with exactness, without their expanding and contracting, "springing" and "warping"—that when we can fit plates so that they will press equally on

Now, does the plaster so expand in hardening, or is the model so changed in vulcanizing as to affect the fitting of the plate?

I will consider these questions in their inverse order.

First. Is the model so changed in vulcanizing as to affect the fitting of the plate?

It is not easy to determine, with absolute certainty, as to just what takes place within the flask. I incline, however, to the opinion, that where the model is properly made of good plaster and well hardened, and the right quantity of rubber is used in packing the case, and the two parts of the flask are properly brought together after having been sufficiently heated to soften the rubber, and where the heat is not carried too high during the process of vulcanization, thereby causing less expansion and pressure of the rubber, and consequently less contraction in cooling, the model will not be so changed as to affect the fitting of the plate, and the plate will be perfectly fitted to the model; but that models are often injured and plates warped, where these conditions are disregarded, there can be no doubt.

Second. Does the plaster so expand in hardening as to affect the fitting of the plate?

Were I to answer this question by a single word, I should say *yes*. Previous to a year ago I held the opposite opinion, although I then knew plaster did expand in hardening, and that it had been asserted "that the expansion in certain qualities and kinds of plaster is very considerable,"* and consequently that a perfect impression and model cannot be obtained with plaster only; yet I considered that it had been shown by satisfactory experiments that the expansion in a block of plaster two and a half inches in length is only $\frac{1}{140}$ of an inch, and I had adopted the conclusion "surely this amount of expansion could not have much effect on the fitting of the plate."† But being in trouble at the time named, and not having been uniformly successful in practicing in accordance with former opinions and theories, I put them aside and began to investigate independently of them.

After having experimented with many different lots of plaster, obtained from different sources, and at different times from the same source, I conclude there is but little uniformity in its practical working. One lot sets quickly, is hard and good, while another lot obtained at the same place "prepared expressly for dentists," sets slowly, is soft and poor. And so in regard to its expansion. *One lot will expand very considerably, while*

the hard palate and alveolar border, the "soft parts" being pressed up sufficiently to exclude air and fluids, we shall conclude we have not known much about "suction" as a rule, and that the palatal bone has been greatly defamed, or in other words, if I may so speak, made a scapegoat to bear other than its own faults.

* The Vulcanite, vol. i., No. 4, p. 156.

† DENTAL COSMOS, vol. i., No. 3, p. 119.

another lot expands very little. Some plaster which sets quickly will expand very much, while another lot which sets readily will expand but little; the same is true of that which sets slowly, and of plaster of different grades of fineness. The plaster I was using a year ago, and which I now believe caused me much trouble, was a very fine, nice article, set readily, and seemed to be so good that I congratulated myself on having obtained it; yet I afterward found that it expanded many times as much as some other equally good plaster which I have since used. I presume, however, that the change which takes place in most plaster, in the quantity used for a single impression and model, would not, in a majority of cases, perceptibly affect the fitting of the plate, could it be so used as to leave it free to expand in all directions. *But the trouble from the expansion of plaster, in impressions and models, is principally caused by the way in which it is of necessity used;* being used in strong impression cups, it cannot expand in a lateral direction on account of the resistance offered by the sides of the cup. In an upper impression and model, it will so expand as to raise the plaster from the centre of the convex surface of the cup and impression, thereby increasing the palatal circle of the impression and model, which causes a plate fitted to the model to rock upon the palatal bone. A lower impression and model will be so changed that the plate will not rest evenly upon the whole surface of the jaw.* To show the change which may take place in an upper impression, fill an upper impression cup with good plaster, mixed in the ordinary manner: or, what is better, take an impression in plaster; let it remain until well hardened; then with a sharp knife remove the plaster from the centre of the posterior part of the cup for the space of an inch or more along its edge, and extending into the cup a fourth of an inch; if the plaster has expanded with sufficient force to produce any perceptible effect, it will be found raised from the base of the cup. With some plaster poured into a common britannia cup, I have found it raised so as to admit a piece of plate of the thickness of thirty-two of the wire gauge. It should be remarked that the expansion will be greater when the plaster is poured upon a clean polished surface, than when used on one which is otherwise, and which offers more resistance to its free movement.†

Now, what are the methods employed for remedying this difficulty, in the use of plaster for impressions? So far as I know, three methods have been employed.

* For a more particular statement of the change caused in a lower plate, I refer to an excellent article on "Taking Impressions," by John C. K. Crooks, M.D., published in the last—March, 1866—number of the DENTAL COSMOS, p. 477. The present article was written before that number of the Cosmos was received.

† With this fact in mind, it is easy to see that impression cups could be so made as to prevent, to a greater or less extent, this change in the plaster.

One is to proceed with the impression and model as if they were perfect, and then depend upon bending the plate to give it a more perfect adaptation.

Another is—taking advantage of the fact that plaster does not expand to its full extent for some minutes after it has begun to set—to use the impression *immediately* after it is taken from the mouth for obtaining the model.

A third—and, as it seems to me, the best method—is to take first an impression in wax, then cut out a thin portion of the wax from the whole surface of the impression, and supply its place with a thin coating of plaster, thereby using as little plaster as is possible, and still take an impression in plaster. After this, make the model of plaster and some other substance, as silex, mixed with it. I have found a model made of plaster and cement to work very well for metallic plates, but the cement affects the rubber when vulcanized upon such a model.

But, during the course of my experiments, I became impressed with the idea that there must be some substance—probably of an alkaline nature—of which a solution could be made in water and easily used with plaster, which would prevent its expansion. I knew some artisans were in the habit of using various substances with plaster to affect its practical working; but so far as I am aware, no one had discovered in any substance just the properties which I fancied might be found and applied for this purpose.

Accordingly I began to experiment with various substances, among which I found some that would prevent the expansion of plaster, but at the same time caused it to set slowly, and otherwise injured it. At last, taking a suggestion from a foot-note in "Harris' Principles and Practice of Dental Surgery," 7th ed., p. 710, which reads: "The solidification of the plaster will be hastened by adding a little salt or sulphate of potash," I determined to try sulphate of potash, without expectation, however, that it would prove to be the substance I was looking for. But on testing it, I became convinced in my own mind that if sulphate of potash is not the best substance which can be used to prevent the expansion of plaster, yet that it does prevent it, so far as its use in dentistry is concerned, either wholly or to a very great extent. April 17th, 1865, I commenced using it in impressions and models, and have used it constantly since, with gratifying success. I now call attention to it, in order that it may be more generally tried than it has hitherto been, desiring that, if thought useful, others may be benefited by it; or, if otherwise, that some wiser and more fortunate fellow-laborer will suggest something better. I know of no possible objection to its use in impressions, but much advantage every way. It hastens the setting of the plaster so as not to leave anything to be desired in this respect, and prevents its expansion, if not entirely in some plaster, yet to a very great extent. I know of no objection to its use in models, unless it be from the fact that although it will

at first cause the plaster to set quicker, yet, as I have thought, it afterward requires more time to expel the moisture wholly from it. This can be accomplished by subjecting it to a low degree of heat, *and when accomplished, the model will be found to be as hard and quite as good for use as it would have been if the potash had not been used.*

For mixing plaster, I have adopted a method suggested to me by a blockmaker, and think it better than the method usually recommended in dental works. Where sulphate of potash is used, I regard it as the only proper method. It is as follows: put a sufficient quantity of water into the mixing-cup, then put in *without stirring*—need not be particular to sift it in—plaster enough to make a batter as thick as you wish; let it stand *undisturbed* until the water has thoroughly permeated the plaster; then stir it a little, and use immediately. The potash will cause most plaster to set so quickly, that it will not work as well if hastened by stirring while putting it into the solution.

In regard to the quantity of sulphate of potash to be used, no rule can be given which will apply in all cases, on account of the difference in the potash and in plaster. As a general rule, I have used from three to four drachms of sulphate of potash dissolved in a quart of water. So far as my experience goes, I have found that what is known with us in Massachusetts as “Eastern plaster,” requires very much more potash to hasten its setting and prevent its expansion, than with that which is known as “New York plaster.” With some lots of the “Eastern” I have used eight drachms to a quart of water. The potash should be of the best quality—that prepared for medicinal purposes being more soluble than the crude.

I will add, I am well aware that I have not exhausted my subject, and that I have a strong conviction that it requires, and the interests of the profession demand, that it should receive the attention of a thoroughly scientific, *and*, if such there be, *practical* chemist.

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from page 513.)

FIBROUS tumors affecting the bones (*Braithwaite*) are usually found upon those of a spongy nature, upon the ends of the long bones, the phalanges, pelvis, and lower jaw. (I will take the liberty here to correct the author. I have described these tumors as associated with the alveoli, with the external periosteum, and with the antrum of Highmore, and I know that they do thus affect *both* jaws, as I have met with them often enough practically, and so has any man who has had any extent of experience.) So far, says this author, as I have met with them, they

are confined to the exterior of the lower jaw, growing from the periosteum and creeping along the surface of the bone in such a manner as to prove almost to a certainty that they originate in some morbid condition of the periosteal fibres. The bones underneath these tumors may suffer absorption in consequence of the pressure produced, but do not seem to be affected in any other way. They appear upon the maxillary bone more frequently than upon any other part of the skeleton. On the lower jaw they spread along the ramus, encircling it beneath and on the sides, so that the bone is almost concealed by the tumor. In some instances they form within the substance of the jaw, probably from the alveolo-dental membrane, and as they increase, the walls of the bone become spread out over them. They grow up around the teeth, and when they project into the mouth may be soft and fungous.*

In some instances the fibrous tumors of the jaws exhibit a semi-cartilaginous structure, and now and then fibres or plates of bone are formed in various parts of them. The progress of the disease is well illustrated by a series of tumors of the jaws in the College of Surgeons, London, from the museum of the late Mr. Liston. These preparations serve to show how necessary it is to bear in mind the mode of growth of these periosteal fibrous tumors of the jaws, because from their disposition to creep along the surface of the bone, whether it be an endosteum or periosteum, they are liable to return after removal, unless the immediately adjacent as well as affected parts be excised. The histories attached to the specimens teach that very large fibrous tumors, both of the upper and lower jaws, together with the bones on which, or in which they grow, may be successfully removed.

Now, as to the degeneration of sarcomatous tumors, it is, I think, a question beyond doubt, that a tendency, greater or less, to retrograde metamorphose belongs to this class. I need only instance the myeloid growths of Mr. Paget, just considered. Certainly nothing could more closely resemble medullary cancer, in, we may say, its incipient stage. And what are we to understand of the recurring fibrous tumors if there is no carcinomatous association?

Concerning the diagnosis of the sarcomatous tumors, and the ability to follow them through their gradations, it seems most important that we should not be ignorant of the distinguishing signs that exist.

I remarked that osteo-sarcoma was not unfrequently confounded with spina ventosa. Now the point at which these two different conditions most nearly approach each other is in the hydatid and other cysto-sarcomatous growths.

* Presenting this phase the tumor may be classed with the Epulic, but it is seen that on this account, there need be no confusion. Many Epulic tumors are osteo-sarcomatous.

Cysto-sarcoma, as implied by the prefix, is a tumor of only semi-solidity, its interior, or stroma, being made up of cysts and fleshy substance. These cysts are original formations, and not of secondary character; that is, they are not the result of molecular disintegration. They are lined sacs, having a distinct secretory membrane. Miller describes the contents of these cysts as widely differing, and which every one must have observed: They are more or less fluid, sometimes a clear gluey liquid, sometimes a gelatinous, pale mass of semi-solid consistence, elastic, and projecting beyond the level of the cut cyst on a section being made; sometimes a solid, consisting of a fibrous deposit, organized very imperfectly, if at all; sometimes of an exanthematous or poppy consistence, as in many encysted tumors; sometimes, but more rarely, a dark fluid, like printer's ink, is contained; sometimes blood is mingled with the contents, either in the solid or in the coagulated form.

The very nearest approach, however, made by cysto-sarcoma to spina ventosa, is in that class, very well named by some one, as I remember to have seen, the "cysto-succulent." These are sarcomatous tumors, the stroma of which is made up very loose fibro-cellular tissue. They might well, in their contents, be likened to that of a water-melon, solid enough on section, but compressible to a few shreds. The fibrous contents of the stroma are, however, always a distinguishing sign. These tumors are very rare, and particularly so about the bony structure.

Müller has described a variety of these cysts as sarcomatous growths, which he calls cysto-sarcoma phyllodes. "The tumor," he says, "forms a large firm mass, with a more or less uneven surface. The fibrous substance, which constitutes a greater part of it, is of a grayish-white color, extremely hard, and as firm as fibro-cartilage. Large portions of the tumor are made up entirely of this mass, but in some parts are cavities or clefts, not lined with a distinct membrane (an exception to the rule in cystic tumors). These cavities contain but little fluid, for either their parietes, which are hard, like fibro-cartilage, and finely polished, lie in close apposition with each other, or a number of firm, irregular laminae sprout from the mass and from the walls of the fissures, or excrescences of foliated or wart-like form sprout from the bottom of the cavities and fill up the interior. These excrescences are perfectly smooth on their surfaces, and never contain cysts or cells. The laminae lie very irregularly and project into the cavities and fissures like the folds of the psalterium in the interior of the third stomach of ruminant animals. Sometimes the laminae are but small, and the warty excrescences from the cysts are very large, while, in other instances, both are greatly developed."

Cartilaginous, or the enchondromatous tumors of Müller, might, perhaps, for all practical purposes, be classified with the sarcomatous, for while it might demand some little stretch of the imagination to convert a cartilage into looking like a fleshy mass, yet surgically the species are

very much alike, that is, both are reasonably benign, both are little amenable to the action of the sorbefacients, and both are better treated by the knife than in any other way.

As we understand the osteo-sarcomatous tumors proper to be outgrowths associated with periosteal membranes, so we are led naturally to ask ourselves as to the cause of their formation. This I conceive to be twofold: first, as the result of local irritation; second, as the result of constitutional conditions; and, still again, we may combine these two, laying the predisposing cause on the one and the exciting on the other.

Only this morning my attention was directed by Wm. Gibson, late Professor of Surgery in the University, to a case markedly illustrative of this latter condition. An old gentleman of this city, Mr. F., seventy years of age, was struck on the cheek by a stone about a month or so back while riding out. He has now growing from the site of the injury a tumor, diagnosed by Prof. G. as osteo-sarcomatous. The growth of the body is so rapid and so formidable as to incline to the view of its intimate relationship with malignancy. No one would, I think, doubt the twofold relation of such a tumor.

When osteo-sarcoma takes on this rapid growth, its innocency may always be doubted; when the development is slow and regular, and particularly if the origin can be traced to some local irritant, extirpation may be expected to result in a complete cure.

When these tumors are fairly and openly benign, we find no constitutional disturbance associated with them, at least none that are outside of strictly mechanical influence.

Osteo, or simple sarcomatous tumors of the sinus maxillare, should not be mistaken, as has too often been the case, for polypus of the nares. It sometimes happens that these tumors, particularly the softer kinds, find their way through the outlet of the sinus into the nostril, and there simulate very closely a common fibrous polypus, and such tumors have been often highly aggravated by operations founded on such mistaken diagnosis. Again, polypi of the nostrils may find their way through the same passage into the sinus, and, enlarging, represent very fairly the ordinary sarcomatous tumor of that cavity. Now, pathologically speaking, being somewhere about one and the same thing, it would be little difference where or how the growth should develop, but as operative proceedings are concerned, a mistake of the kind becomes quite an awkward matter.

As regards changes common to the sarcomatous tumors, they may be considered under the heads of softening, suppuration, and malignant degeneration.

Softening, says Dr. Humphrey, appears to take place in two ways:

First, as a chronic process, affecting some circumscribed portion of the tumor, which is usually at or near the centre. The change is observed to commence with a slight discoloration, a yellowish or dark tinge, which is

followed by a loosening or incipient disintegration of the structure; at the same time a line of demarkation is formed around the altered portion, which becomes separated, like a sequestrum, from the surrounding mass. Both the detached portion and the cavity are at first rough and thready on their opposed surface; the former undergoes still further disintegration and solution, becoming broken up into a number of smaller fragments, which float about in a dark, dirty, turbid fluid, and which may ultimately disappear.

The process of destruction may go on in the adjacent portion of the tumor, enlarging the central cavity till the whole is reduced to a fluid or a semi-fluid mass, walled in by the capsule of the tumor, which now stands in the relation of a cyst wall to the disorganized contents.

In some cases the softening process is completed without extending the circumference; the ragged processes hanging into the interior of the cavity are removed. The latter acquire a smooth lining, and look like a simple cyst lying in the cavity of the tumor.

A second mode in which softening takes place is more rapid and diffused, the whole or the greater portion of the tumor being affected at once. The change commences with the infiltration into the mass of a serous fluid whereby its texture is loosened and its components separated, at the same time the tissue of the tumor is softened, and interstitial absorption is set up in it.

As the result of these processes combined, the tumor is soon broken up into detached fragments, and reduced to a diffuent pulp, or it may be completely liquefied. These changes, Dr. Humphrey suggests, "are occasioned by some altered nutrition analogous to inflammation; they may be induced by some accidental cause, as an injury, nevertheless they are not necessarily attended with any constitutional disturbance at all corresponding with the extensive destruction which is in progress."

Suppuration.—This is very rare; it may commence internally, or progress from without inward.

Cancerous degeneration.—The general conditions and features of such degenerations have been considered in the body of this paper. It remains, however, to point out a second cancerous relation, namely, the existence of compound tumors. Dr. Lewis (*Braithwaite*) relates a case where melanosis was deposited in the stroma of a fibrous tumor, and Dr. Humphrey exhibited a large fibrous tumor completely enveloped in cancer. In such cases we can only infer the fibrous tumor to have existed through a provocative local irritation, while the cancer conjoined with it is a separate and distinct disease, the result of cachexia.

(To be continued.)

GASTRIC ACIDS—THEIR DELETERIOUS INFLUENCE ON THE TEETH.

Read before the New York Society of Dental Surgeons, January 17th, 1866.

BY A. C. CASTLE, M.D.

(Continued from page 518.)

GASTRIC acids are influenced by a certain law or order of action; being generated in accordance with the peculiar constitutional diathesis of each individual; they also appear to act upon the teeth, guided by certain laws. Every dentist will admit that, as a general rule, they make their selections on certain portions or parts of the teeth in different individuals. Dr. J. M. McCormick, a distinguished surgeon in the British army, in the *Transactions of the Medical and Physical Society and Journal of Calcutta*, cites numerous interesting cases of affections of the teeth, wherein bad diet produced gastric acids which caused dental irritations. He says: "Under these circumstances, the gums invariably presented a pulpy, spongy, hemorrhagic, and vegetating surface; in many instances the teeth perpendicularly split in two."

No doubt all of you, gentlemen, have observed, as I have in my practice, that the teeth of group No. 1—the large, dense, yellow teeth—are met with in those persons *only* who possess a solid, vigorous constitution, a firmly knitted frame, generally large boned, with splendid muscular development, nervous strength, and superior powers of endurance.

The second group—the dense, yellowish-white teeth—represent these constitutional marks in a lesser degree. The bones are smaller, the muscles not so markedly developed in outline: the limbs are rounded, and the eyes and features present a softer character or expression; and although the physical strength and power of endurance are not so great as those possessing the first group, they, nevertheless, enjoy general good health.

The third group—the opaque, chalky-white teeth. The transparent, yellow white teeth, and the opaque, yellow chalky teeth, present the index of bones with less phosphates and more animal constituents, with softer and more delicate muscular formation and repletion of cellular tissue. The habit of body is more or less strumous, tuberculous, and predisposed to cachexy.

The fourth group—the transparent, glassy, chalk white, the transparent yellow, and the pearly, bluish-white translucent teeth—the theme of poets, the song of the lover, the *desideratum* of beauty, woman's envy, bespeak for their unhappy possessors a watery blood, a sero-lymphatic temperament, deficient constitutional stamina; weakly, chlorotic, and impressible by the slightest changes and most trifling influences or causes. Predisposed to anæmic conditions, to strumous disorganizations of the

tissues, and constantly in danger of pulmonary consumption or glandular disorders.

Thus the dentist can demonstrate the marked difference of constitutions in man by the physical densities of the various grouping or classification of the teeth. As obdurate granite represents the solid foundation of the earth, by way of illustration it may represent group No. 1 teeth. So the yielding alabaster may represent the softer densities of groups three and four of dental frailty. Every dental practitioner must have noticed the force called into requisition to dislodge a tooth from the jaw of group one, in comparison to the ease with which he extracts teeth of the third and fourth groups; how frequently the soft *gelatinous* alveolus is brought away adherent with the latter.

The gastric acids act with distinguishing marks upon the several groups, in accordance with their density. I shall not detain you by dwelling upon these, but incidentally refer to the action of gastric and buccal acids upon the first—the dense, firm, yellow teeth. Because these are the best constructed of the dental family; because upon them and their surrounding tissues, we observe the peculiar action of the acids; they do not corrode or eat away the substance of the teeth; they simply denude the teeth of their alkaline protection; like sand they appear merely to aid friction, and hence the wearing down of the crowns of the teeth. Thus by constant attrition, we see the teeth worn on a level with the gums. Where oxalic acid is present, we find the same action with the additional irritation made upon the margin of the gums, causing them to recede from their adhesion to the necks of the teeth; in the latter, often we meet with deep, smooth grooves, as if the friction of a sharp cord by constantly passing over them had worn the grooved indentation into the necks of the teeth. Sometimes this grooving progresses to a sufficient extent to cause the teeth to break off. The receding of the gums, however, most generally continues until the teeth one after another fall from their supports, depriving the animal economy of their services. Those hard, semilunar circles of dark-green salivary calculus, embracing the necks of these teeth immediately beneath the edge of the gums, is an oxalate. The instrument detaches it with a sharp, clicking sound, often requiring considerable force to detach it from its adhesion. This salivary calculus is very destructive to the teeth. It is rarely met with on the other classes of teeth: it gradually insinuates between the periosteum and the bony tissue *eating* its hold into the fangs, superinducing the absorption of the alveoli and the gums, while it gradually causes the atrophy and then the death of the teeth. In this manner they are rendered extraneous, as it were, to the animal economy, and they fall from the jaws.

Most remarkable it is, that these adamant bone constructed teeth, which to our conception, from their extreme density of structure would

appear to possess the least vitality compared with the other named groups, which are constituted with more animal organic constituents, possess not only more vitality but most wonderful vital principles, powers, and *internal* restorative resources (which are rarely met with in other classifications of the dental organs). Although they do not possess the power entirely to combat the onslaughts of their antagonisms and maintain their integrity complete, they are still endowed with sufficient organic vitality to prevent their disorganization or decay.

As the crowns of these teeth are worn down by the mechanical attrition of masticating the food, which is materially aided and increased by the acids I have mentioned, the internal blood-vessels, the nerve pulps and their nerve branches connecting them with the main nerve, *RECEDE, paripassu*, with the wearing away of the teeth. In many instances, so rapidly do the acids avail themselves of the abraded surfaces, that the teeth are rendered exceedingly, and acutely sensitive, where deep concave indentations are formed by the action of the acids. The internal blood-vessels, nerves, etc. of these teeth, then, being superexcited and stimulated into action by the irritating effects of the atmosphere, gastric and buccal acids results in the secretion of, and pouring out and depositing into the *tubuli* or porosity of the crown of the abraded teeth a *transparent amber-like ossific matter*, which is contradistinguished from the true bone of the teeth by its physical and chemical characteristics; and which, being secreted *within the teeth by the dental secreting vessels*, presents the *dentine proper*. The tissue of the organized bone of the teeth is no more *dentine* than the bones of the crania are *cranine*; or the nasal bones are *nasaline*; or the tusks of the elephant or hippopotamus are *tuskine*. This peculiar secreted *dentine* is freely poured into the *tubuli* of the bone of the teeth, to replace its loss from attrition. As I have already observed, in many instances, the wearing away of the teeth is so rapid* that the nerves and blood-vessels of the dental chambers do not recede in the equal proportion necessarily demanded of them to escape the action of external agents: hence their increased sensibility;† hence the sympathetic, periodic, or chronic nervous headaches; hence neuralgic sympathies in the face, the ears, the eyeballs, the temples, the

* This process and action of gastric acids may be seen more completely on the teeth of sailors, who live on "hard tack" and *salted* provisions, which largely increase the formation of gastric acids, which, in their turn, aid in the attrition of the teeth.

† The teeth of horses are peculiarly affected in this manner. Many of these noble animals, otherwise in high condition of perfectness, are disposed of at a great sacrifice because their "*teeth are tender*." They cannot eat their food; consequently they lose flesh, muscle, and strength. Veterinary surgeons, whom I have taught to treat these cases, now readily overcome this difficulty, thereby saving many valuable animals to their owners.

head, the neck, or shoulders, either separately or combined, often sympathetically affecting the whole nervous system, and posing too often the ignorance of medical practitioners who, unaware of these sympathetic and symptomatic symptoms of the superexcitement of the dental nerves from these external causes, irritating the dental economy, treat their patients for idiopathic neuralgic, rheumatic, and their attendant affections. It is in the cases to which I now *particularly* refer and ask your attention that *hypertrophy* of the fangs of the teeth is mostly to be observed. We have a right to the inference that the rapid secretion of the dentine being prevented from depositing itself where it was intended to replace the loss of the substance of the teeth by acids and attrition, the secretion seeks other localities, and we find it on the "*hypertrophied*" fangs. To this hypertrophy, the result, not the cause, the best learned and most experienced dentists attribute all the painful symptoms distressing the patients; and for which they propose many "heroic"—I need not say—futile treatments.

The secretion of the dentine continuing, the nerves and blood-vessels still recede before the wearing down of the teeth, until finally the nerve-chambers themselves are completely filled by its deposit; and thus by their own action, the nerve and blood-vessels are obliterated from the dental economy; and now what remains of these originally adamant bones and perfectly organized teeth, are the semi-transparent, shrunken, or atrophied apologies for dental organs.* These vital organics being thus obliterated from within the teeth and the *dentine* now filling in the tubuli of the bone, reduces their vital resistance to a condition as to permit the action of the dental absorbents upon their remaining substance; the *original bone* is gradually absorbed, leaving the amber-like deposited dentine to occupy its place—the "mere oblivion" of the teeth, in the state of *atrophy*, we find them. This natural process, no doubt, harmonizes with nature's intention in common with the gradual decay accompanying old age.

* * * "Last scene of all,
Is second childhood, and mere oblivion,
Sans teeth, sans eyes, sans taste, sans everything."

This synopsis of my observations upon the acid diatheses, from infancy

* The teeth of the graminivorous animals demonstrate this secretion of the dentine into the atrophy of the external tooth. Calves' teeth are very large, the roots completely hollow. The "artificial teeth," in former years used by dentists as substitutes for natural human teeth, which were scarce and high-priced, from being imported from France, were old cows' teeth, worn away by attrition, and solidified by the deposit of dentine in the pulp chamber. Place such in a dry heated place, near the stove, for a few days. The dentine will shrink from the cementum, perfectly modeled after the form of the dental chamber.

to age, from first "the puling infant" to the "last scene of all," may afford you some hints to aid your endeavors, as well as mine, further to elucidate the action and influence of gastric acids upon the health, upon the integrity of the dental organs, and hence upon the happiness of our fellow-beings. I have availed myself of the resources of the *materia medica*, with marked success; and if my efforts in prophylactic and curative treatment have been crowned with no other success, it will ever remain a source of pride that I discovered the means for the immediate obtunding of sensibility in the substance of the teeth, thereby permitting the direct manipulation of the dentist to prepare the teeth for immediate filling, and securing a cure for dento-neuralgic affections.

REPAIRING OLD OPERATIONS.

BY W. H. TRUEMAN, D.D.S., PHILADELPHIA.

I SUPPOSE there are but few dentists who have not been more or less annoyed with the uncertain results often experienced in attempting to repair old cases.

This branch of our business at best is unprofitable, and has very little margin left for accident, either in the time allowed or the remuneration received.

The patient merely considers an accident, arising from any cause it may, to be an original defect, or the result of bad work, and generally is not in the frame of mind to listen to any explanations that may be made.

Accidents to artificial dentures invariably occur, according to the stereotyped phrase of patients, "while eating something very soft," such as mush, sponge-cake, milk-toast, or rice-pudding, which fact they would have us accept as proof positive that the case had not been made as strong as it should be, and therefore should be repaired for little or nothing, no matter how long it had been in service. They think artificial teeth should never wear out.

It is very desirable to be able to repair old cases with as little risk as possible of either breaking the remaining teeth or changing the fit of the plate, and justice to ourselves requires all the speed we can safely command.

The great cause of danger to the teeth seems to arise from the moisture and fatty matter absorbed into the pores of the teeth being converted into steam or vapor more rapidly than it can escape. To avoid this, various means have been employed to get rid of these before soldering. When I first entered dentistry, the usual method was to boil the case for several hours in a strong solution of caustic potash, frequently washing off with clean water, and finally subjecting it to a gentle heat five or six hours. By this process it took nearly a day to prepare the case for solder-

ing, and, as far as my experience went, it was a useless waste of time; the teeth did not seem to appreciate the labor bestowed upon them.

The next plan tried was to *bake* the case by laying it upon a piece of charcoal and applying the flame of the blowpipe upon the plate at a point as remote from the teeth as possible, and gently increasing the heat until the plate became red hot, or vapor ceased to arise from the teeth. This required only a few minutes, and when performed with care, was mostly successful. I used it for over five years, the greatest objection being the *delightful* perfume it occasioned, and the warping of the plates which sometimes, though not often, gave trouble; accidents to the teeth seldom occurred.

This plan I afterward modified by using a sand-bath, placing a piece of wood by the side of the case, and gradually increasing the heat until the wood was thoroughly charred. I liked it better, but can hardly say what advantage it had.

The method I now use was suggested to me by a fellow-practitioner, about three years ago, and from that time to this has answered every purpose.

After cementing the teeth or parts to be soldered in position, I simply invest the case in a mixture of about five parts sand to one of plaster in the same manner as a new piece of work, using rather more of the investment, and heat up slowly in a furnace or over a gas stove to the soldering point, or a full red heat, and after soldering, do not disturb it until nearly cold. The investment allows the heat to be conducted to the teeth slowly, and, being porous, allows the vapor to pass off freely; after soldering by retaining the heat, it in a measure anneals them, and from the support it gives prevents any warping or change in the plate.

When this process is used, there is no discoloration of the joints between the teeth, as all carbonaceous matter is completely burnt off.

It has a decided advantage over the other methods of "*baking*" the case, as the teeth are required to pass the fire only once.

Some time ago I had an upper set on gold to repair. The teeth were the old-fashioned riveted blocks in three sections, the first one, containing six teeth, being off. It had been riveted several times, and the holes were so large they would no longer hold, and the only way left was to solder them. The back blocks on either side were so firm and tight I did not think it prudent to disturb them, and yet could not trust them through the fire.

I arranged the rivets in place, holding them with plaster in the usual manner, and, placing the case upon a piece of charcoal, built around the remaining blocks a water-tight "coffer-dam" with plaster, leaving as much of the front of the plate exposed as I could. When it had become quite hard, I filled it with water, and with a little tact managed to solder the six rivets for the front block with gold solder without any trouble

whatever. No part of the blocks at any time was hotter than boiling water. As the water boiled out I poured more in, and thus kept my dam full and the teeth cool.

By these means I succeeded in making what seemed a hopeless case as strong as it had been when first made.

So you see the much talked of "coffer-dam" can be made equally useful in keeping teeth wet out of the mouth or keeping them dry in.

Since then I have frequently applied the idea successfully in adding or changing bands, soldering cracks, extending plates, etc. in old cases, by protecting the teeth with a sponge saturated with water. The evaporation of the water in the form of steam prevents the teeth becoming so hot as to injure them. In order to be successful, the parts to be soldered should be easy of access to the flame, and where an investment is required no more should be used than is absolutely necessary to hold the part in position.

A fine pointed flame should be used and the operation completed as soon as possible. By this means, in many cases work can be done with no more risk than is incurred in riveting, while the saving of time and trouble is immense, to say nothing of the increased strength and durability.

The discoloration in the joints of gum-teeth after an old case has been soldered, is caused by not making it hot enough to burn it off. It is always formed if the case has been worn any time in the mouth.

It can be effectually removed by investing the case in a mixture of sand and plaster, then bringing up to a bright-red heat in the furnace and allowing it to cool slowly.

In those cases where it is necessary to use a pure solder, I use block tin in preference to soft solder, which contains lead. The tin requires a little more heat, but has the advantage of being stronger and does not discolor so much in the mouth. It can be made to adhere very firmly by scraping the surface bright and applying a solution of chloride of zinc containing a little excess of acid.

Care is requisite not to use too much heat, as the affinity of tin for gold or silver is so great, a slight excess of heat would be apt to cause it to run through the plate and give a great deal of trouble and annoyance.

When soft solder or tin has once been used upon a case, it is useless to attempt to use hard solder afterward; it so insinuates itself into the pores of the metal that it is impossible to remove it completely without destroying the case.

A small soldering iron is often very useful and convenient.

A soft solder case should be pickled in aqua ammonia, instead of sulphuric acid or alum water.

I don't think a dentist should ever turn "*tinker*" when he can possibly get out of it.

To remove the taste a case is apt to have after repairing, which is so

annoying to most patients, boil for a few minutes in an alkaline solution, such as carbonate of potassa or soda, potash or aqua ammonia, and after careful washing boil in a strong solution of sugar for a few minutes. This is the best way I have found to get rid of a taste often very persistent, and causing annoyance for several days. It is a little extra trouble, but pays in the long run. It shows a care for their comfort which patients are apt to appreciate and remember.

It is a wise precaution to examine the case in the patient's mouth before commencing any repairs. It is a trick with some economical people having an ill-fitting denture to have some trifling repairs done, and when placed in the mouth again they will declare it had always fitted before accurately, and therefore must have been bent, and expect you to make it right for them, a task not always easy to accomplish.

The dentist often finds honor at a heavy discount with a certain class of his patients. A prudent man foreseeing an evil, avoideth it,—so Solomon says.

PREPARING MODEL FOR VULCANITE.

BY R. NEWTON, SAVANNAH, OHIO.

THE impression being taken, the operator should carefully examine the state of the mouth, whether the alveolus of the upper jaw is hard, or covered with a thick cartilaginous substance, and whether there be a hard, bony ridge or point in the roof, and if so, note where. Provision must be made for these things by dressing the impression and model, so that the plate will not press and rock on the centre of the mouth but evenly on the border. This is accomplished in vulcanite work by prudently scraping the impression where the bone ridge or points rested, and subsequently doing the same on the alveolar ridge of the model corresponding to the soft places in the mouth, besides a little all around the border, and sometimes a little at the back edge of the plate between the alveolar and palatine processes, if those places be quite soft, as is often the case.

In cases of aged persons long without teeth, where the alveoli have, by contraction of the lips and other causes, become absorbed and shrunk, this scraping should be continued to the very border of the plate.

In metallic plate work this is imperceptibly accomplished in the process of swaging the plate. This settles the border of the zinc model a little, and the artist subsequently, in fitting, turns up the back edge of the plate to exclude the air. Thus air-chambers have often been made without so intending, and a good fit secured where the same artist would fail in vulcanite.

In extracting, I use an instrument which I find exceedingly convenient for loosening teeth and roots from the alveolar process. It is made of a straight scaler, the point rounded and sharpened. I use it chiefly with

incisor and cuspid teeth, and with it I often succeed in extracting when all other means fail. Recently I removed a cuspid tooth from a lady's mouth in less than one minute after another dentist had some time before spent one and a half hours trying in vain for its removal. It had come late, and, the other teeth filling the range, had presented its point through the mucous membrane far inside the range. I pressed the instrument between it and the bone on different sides, rotating it slightly until it became loose, and easily removed it with forceps.

First Impressions.—1. I prefer, in all cases, plaster impressions, and have not yet found any insuperable difficulty in the way of obtaining them.

2. To prevent unpleasant air-chambers on the impression, put some plaster into the roof of the mouth with the plaster knife just before introducing the cup.

3. Let the final pressure be on the centre of the cup; this makes a far better suction for the plate.

4. For partial sets; if the plaster adheres to the teeth, spoiling the impression, oil the teeth.

5. For front teeth alone, I often use a flat piece of wood about the width of the teeth, on which I place the thick batter, and when it is pressed up, with the finger press the batter that lies at the front, under the lip till it sets.

Air-Chambers.—The air-chamber should be drafted on the impression with a pencil and excavated with a sharp-pointed knife, somewhat deeper than is needed in the plate, and subsequently dressed on the model to the right depth.

Air-chambers are often made too far back, leaving the plate to rock on the bony protuberance anterior to them.

Trimming Impressions.—I find it convenient to trim off the borders of my impressions near to the line where I wish the edge of the plate to be. It affords a good base for the wax and aids in setting the model in the flask.

Trimming Antagonizing Impressions.—The antagonizing impression should have the wax cut away around the border and against the floor of the lower model, and opposite the air-chamber of the upper model until it will rest completely on the alveolar borders of both.

Oiling Models.—I still prefer to oil my models; and for this purpose I use a compound of some soft animal oil and sweet oil. The effect is permanent, even long after it appears to be perfectly dry. The utility is that it preserves the surface smooth until the work is accomplished.

Adjusting Models for Articulation.—The common method is objectionable on several accounts; *i.e.* extending the plaster back of the models and connecting by a cross or cones in the plaster.

1. It is often found necessary to open or contract the impression a

little. This you cannot do without losing that exact control of position necessary in this work.

2. It will not unfrequently be found that the chin was set forward or drawn back of the natural position in the wax. This can scarcely be corrected at all but by taking a new impression, and that may prove worse than the first.

3. In several instances I have found a lateral movement necessary in order to make a perfect adjustment. Here the difficulties are as great as before.

4. Besides, handling the plaster while setting the teeth keeps the hands chalky, and this is unpleasant. And sometimes the operator will, when pressing in the joints, rest the heel against his person, and ere he is aware, his dress is whitened by plaster. The writer has for several months used an articulator of his own invention, capable of all the foregoing movements with entire accuracy, and at any moment the models can, if desired, be restored to their original position as accurately as when first set. It also affords neat and convenient handles for the models during the process of setting and fitting the teeth.

Trial Plates.—For trial plates I prefer in all cases gutta-percha, but they should not extend over the ridge. The edges should not quite reach the pins. Cement them to the plate by melting wax on the ridge at the edges of the plate. If the wax does not adhere, heat the model a little in the lamp at the points where you wish it to hold.

The Arch.—In setting teeth, the arch should not be made too large. The teeth should be carried well on to the model. They will be less likely to tilt in using. The lower molar blocks should be fully on the ridge, and if posterior teeth are a little inside, all the better. Should this confine the tongue too much, compensate, by making the teeth shorter. This rule is especially necessary with aged people.

Waxing up.—In this part of the work I am not so particular about the finish: adjusting it carefully about the teeth, and making it about the right thickness elsewhere, except I put no wax over the gutta-percha of the upper model. I prefer to dress and polish the counter models. It can be done far quicker, and then having but one object in the wax (to get the right thickness), the work will be more perfect. For cleansing the model and counter model, a soft shaving-brush is preferable. This will be thorough without removing the teeth.

Pressing Flasks.—After packing and boiling, I put the flask into a press (temporarily attached to the table for the purpose), in which I can apply the power quickly, gently, and evenly, until the flask is closed; or, if too full, do not quite close, lest the teeth be broken, but open and remove the surplus rubber, boil anew, and fully close. I do not put any strain on the screws until the flask is closed, and I wish to confine it.

Dressing.—In dressing down the upper plate, I never use a file on the

lingual surface, but prefer a set of knives fitted for the purpose. Being unable to purchase suitable ones, I have made them of shoe knives partly worn, of good steel, and sufficient thickness. The edges are curved, some more and some less, to suit different parts of the plate. Some I use for cutting and some as scrapers. They have, among other advantages, this, that being straight, they are easily sharpened on the oil-stone, which all sharp instruments used on rubber frequently need.

How soon should teeth be made after extracting?

1. The upper set, when the fit is good, and is worn day and night, will not usually lose that good fit, even if constructed in a few weeks after extracting. I suppose the pressure of the plate in some cases induces a calcareous deposition which fills the cavities and preserves the form of the alveoli. (I have several remarkable cases of this; I took twenty teeth from a lady's mouth, and in four weeks made a double temporary set, some fifteen months ago; recently I examined the mouth, and the upper alveoli have not altered in shape, the fit is as good as when first put on. So I might mention several others.) On this account, I prefer that the patient should wait until the alveoli have been absorbed sufficiently to receive the gum teeth and present a good shape, and then put in the permanent set and instruct the patient to wear it day and night for one year at least. If a temporary set must be made before the alveoli are sufficiently settled, it should be worn only in the daytime, that the absorption may go on until the gum teeth may be received without distorting the face.

2. The lower alveolus will, I suppose, continue to absorb slowly until but little of it remains in old age. One advantage of the vulcanite is, it can be cut away and still be made to fit for a long time; nevertheless, it will have to be renewed every few years.

Removing Teeth from Plates.—Take a small gouge (such as wagon-makers use, simply a narrow chisel, curved up at the point), with this cut away the rubber over the pins (by a rotary motion while cutting) until the heads appear. Put oil in the trough, hold the teeth in the lamp (not the rubber) until the rubber becomes softened, then a slight pressure on the plate or teeth will press them out usually quite clean.

REPLACEMENT AND REUNION OF A LOST TOOTH.

BY ALEX. I. BIGELOW, CLINTON, MASS.

AGREEABLY to request, I give an account of the manner in which my left superior central incisor was unceremoniously removed nine years ago, at the age of twelve, without the aid of forceps. I was running over some logs, and accidentally tripped, fell forward, striking on my mouth with considerable force and cutting my lower lip quite through on the upper centrals. I naturally sped to the house, distant about twenty rods; on

opening my mouth for inspection, one tooth was missing; my father went in search and found it a few yards from where I started. The tooth was inserted and forced home by "*hand pressure*," and remains as firmly articulated and serviceable as the other incisors, the only perceptible difference being a slight yellowish tinge, not apparent to a casual observer.

These are the facts, and so much of foregoing as will contribute to the cause of science, you are at liberty to make use of.

The writer of the above is a student of dentistry, whom I recently met in New England, and having my attention directed to his tooth, the request was made for a history of the case.

J. H. M'Q.

PROCEEDINGS OF DENTAL SOCIETIES.

PROCEEDINGS OF THE ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

BY THOS. C. STELLWAGEN, D.D.S., A.M.

(Continued from page 537.)

A MEETING of the society was held on Monday evening, March 5th, 1866, at the Philadelphia Dental College. The President, Dr. Jas. M. Harris, in the Chair.

Dr. Flagg called the attention of the society to the subject of Dental Nomenclature, and moved that a committee be appointed to consider and report from time to time to the society. Upon motion of Dr. Stellwagen, Drs. Flagg and McQuillen were unanimously elected to serve upon this committee.

The subject for the evening's discussion,

"ALVEOLAR ABSCESES,"

was opened by Dr. Flagg, who regarded an alveolar abscess as that form of disease in which some irritant had exerted its power until devitalization of tissue or "suppuration" had occurred between the alveolar plates, or about the roots of the teeth; that for its treatment it was necessary to divide it into three classes, each of which presented peculiarities which rendered particular processes subservient to the proper meeting of indications—

- 1st. Where abscess is present without any commencement of fistula.
- 2d. Where fistula was almost pronounced.
- 3d. Where fistula was present.

For the irritant, he would say that putrescent pulp tissue, necrosed root or necrosed bone would cover all ordinary *local* causes, and the action of systemic influences upon overworked periosteum would cover *constitutional* causes.

In order not to consume too much time, he would take up the consideration of the third form of abscess, and give his usual treatment. When a tooth presented in connection with which was an abscess and *fistulous opening*, he suspected putrescent pulp tissue as the excitant, unless the usual signs of necrosed tooth were present, or systemic condition, as typhoid, pregnancy, etc.

He first instituted search for this cause of trouble by drilling into pulp cavity, or removing filling (including root filling), if such were present, and thus put the tooth in a "natural state;" then prepared it as thoroughly as possible, and, if complete thoroughness was the result, he filled the canal with cotton, saturated with creosote and cloves, capped this with gold or gutta-percha, and, if necessary, filled immediately. Was careful not to "pump" creosote through the foramen, and permitted "nature" to do the work of curing the fistula, which she usually did much better than the best dentists!

Without any "dressing," the cure was usually effected in from two days to a week, and the patient was requested to present for inspection, merely to see that all was right.

When immediate cure did not result, he waited patiently for two or three weeks, or even more sometimes, and found this quite as expeditious as the Iodine & Co. method. He usually preferred filling temporarily for one week, and then filled permanently; but very frequently cleaned and filled at one sitting.

Dr. McQuillen, referring to the formation of abscesses at the roots of the teeth in cases where the dental pulp had become devitalized without exposure from decay, but due to external violence, and also to those in which an exposed pulp had been treated with the arsenical paste, then extirpated, and the pulp cavity properly filled with gold foil, said that, in treating the first class, the indication, of course, was to open into the pulp cavity of the tooth by drilling through the crown, and removing all foreign matter by thoroughly syringing with tepid water. This simple treatment, in many instances, proved efficacious; but there are cases frequently presenting in which a more decided local combined with constitutional treatment is demanded, wherein the employment of creosote, iodine, and other local applications, united with the exhibition of tonics to act upon the general system, is indicated. When an abscess forms at the root of a tooth (the pulp cavity of which has been filled with gold), and is confined within the alveolus, two plans of local treatment present themselves: one being to remove the filling from the pulp cavity, the other and most advisable, to drill through the walls of the alveolus, and thus establish a fistulous opening for the exit of the pus, and subsequent syringing with water, or the application of the remedies just referred to.

Dr. Breen said he had not been as successful as his friend, Dr. Flagg, in the treatment of alveolar abscess. Last September, Miss T., aged

twenty-four, of nervous temperament, called to have the left superior second molar extracted; after diagnosing, he told her he could save the tooth. He proceeded with the usual treatment of excavating, syringing, and forcing a pellet of cotton, saturated with creosote, into the roots; and in six days, the patient not complaining of soreness to the touch, or on inserting the broach, he filled. Two weeks after, the patient returned with abscess and fistulous opening; he removed filling, and injected with camphor and officinal tincture of iodine, opened the abscess, and washed with dilute tincture of myrrh; after ten days found no soreness to the touch, and filled a second time. Some two or three weeks having elapsed, the patient again returned with trouble; he now removed the filling, washed with cold water, laid the abscess open to the root near the apex, syringed clean; then forced a tent of cotton, saturated with creosote, up through the opening to near the apex of the root. He believed there was an enlargement of the posterior buccal apical foramen; injected and saturated the roots well with creosote once a week for three weeks; at the expiration of that time, there being no soreness, he filled, and it has given no trouble since.

Dr. Haywood asked, if it would be advisable to treat a case of alveolar abscess, where there was a scrofulous tendency, or development of that disease was patent; or where an hereditary predisposition to abscess exists? He had known cases where the father, or mother and children, have suffered from this disease, no matter whether the teeth were carious or not. Since last November no less than six cases of general abscess occurred; one of these cases ending in cancer and death in two weeks after the removal of the tooth.

Dr. Harris here made a few remarks, in which he referred to his experience as an old practitioner in the treatment of alveolar abscess.

Dr. McQuillen could not conceive of the possibility of the formation of an alveolar abscess at the apex of a single-rooted tooth without its being attended with the destruction of the vitality of the pulp. Depending, as the latter does, upon its supply of arterial blood through the foramen at the apex of the tooth, the existence of an abscess would be sufficient to cut off the nutrient fluid, and death of the part must of necessity supervene; indeed, prior to the establishment of the abscess, and during the early stages of inflammation, this result would be likely to occur. In his comprehension of the subject, devitalization and disintegration of the pulp, as a rule, precede and induce rather than follow the inception of alveolar abscess; he admitted that there were cases in which an alveolar abscess may exist in connection with a vital pulp, as, for instance, when found in connection with one of the roots of a molar or bicuspid, while the other root or roots were in a healthy condition, and the portion of pulp within them duly supplied with blood. He objected to the views advanced by a preceding speaker, in which the pus-globules were spoken of as being

made from the blood-corpuscles. This was not correct, for pus is a fluid composed of serum and dead exudation-cells; which cells, had they gone on to maturity, as in the normal operations of nutrition, would have formed tissue, but, failing to do that, become one of the components of pus.

Dr. Stellwagen thought he could understand how an alveolar abscess might be caused about the neck of a tooth, or just under the free margin of the gum, by a foreign body, as a splinter of a tooth-pick, and yet not be severe or general enough to destroy the vitality of the pulp; but, notwithstanding the fact that the coats of some of the larger arteries have been able to withstand for some time the morbid influence that broke down surrounding tissue into pus, he could not well conceive how such delicate vessels as the apical artery and vein of a tooth would remain intact, if the abscess should extend to the apex of the root, or how a pulp could maintain its vitality for any great length of time under such a form of disease.

Dr. Flagg said that a vital pulp could be present in connection with an alveolar abscess, particularly in multi-rooted teeth; that he had seen several cases of this, but that the abscess was never at the apex of the root; had never seen an abscess in connection with a vital pulp in a single-rooted tooth, but had seen abscess in connection with lower molars containing *fully vital pulps*, caused by malocclusion, and cured by treatment directed toward its removal.

Dr. Knox had extracted many teeth, for persons not having the time or means to spare for treatment, and he had found, after extraction, that some molar teeth, with an abscess about one root, had vital pulp in the other roots.

Dr. Dickey wished to inquire if any member had observed cases in his practice where, in patients predisposed to tuberculous consumption, the formation of a fistulous opening, and the free discharge of pus, had apparently developed the dormant disease, and been followed by the rapid declining of the patient. Dr. Dickey thought he had seen such cases.

Dr. Flagg thought that a theory of his friend, Prof. Morgan, pertaining to the development of tubercles, as the result of arrested pus formation, was worthy of consideration in connection with the remarks of Dr. Dickey.

A meeting was held on Monday, April 2d, 1866, at the Philadelphia Dental College. Dr. Jas. E. Garretson in the Chair.

Dr. J. H. McQuillen, the Corresponding Secretary, read a letter from Dr. Jas. McManus, of Hartford, Conn., on the subject of tooth powders, which, on motion, was ordered to be placed on file.

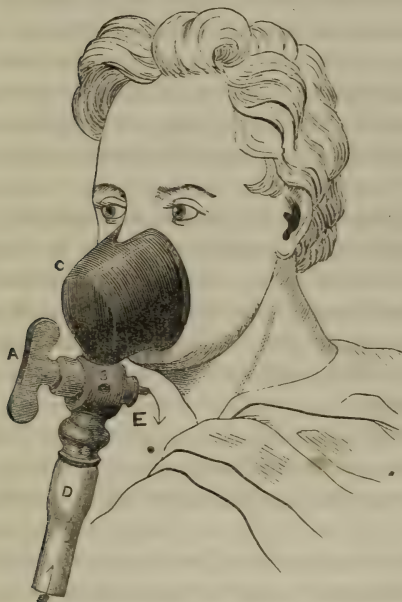
The same gentleman then exhibited a mould for the correction of the

centres of corundum wheels, invented and presented to the society by Dr. E. H. Danforth, Jamestown, N. Y.

Dr. J. Foster Flagg moved that the thanks of the society be tendered to Dr. E. H. Danforth, which was unanimously adopted.

Dr. Jas. Goodwillie exhibited to the society an invention of his brother, Dr. D. H. Goodwillie, of New York City,

A NEW INHALER FOR ALL ANÆSTHETICS.



DESCRIPTION.

- a.* Faucet, containing the valves and revolving quarter of a circle.
- b.* Fresh air valve.
- c.* Face-piece.
- d.* Inhalation valve.
- e.* Exhalation valve.

He said that the inhaler is considered to be simple, safe, efficient, and economical. It is particularly adapted to the administration of nitrous oxide, as that agent is inhaled in a pure state.

The breath (carbonic acid) is thrown off by the exhalation valve (*e*), thus avoiding the danger of asphyxia by noxious inhalation.

It should be used from a large bag or gasometer, care being taken not to admit any air, as it prevents perfect anæsthesia. Two face-pieces (*c*) are provided, of different sizes, to suit all cases. Perfect anæsthesia is best produced by full, quick inspirations. The patient may breathe fresh air without removing the inhaler, by turning the faucet (*a*) a quarter of a circle.

In administering chloroform or ether, which is done direct from the bottle, provided with an inhalation cork, the faucet (*a*) should be turned a little to admit fresh air, and by this you are quite sure your patient is getting air, and thus prevent asphyxia.

None of the chloroform or ether is wasted, and less than half the quantity ordinarily used in any other way saved.

The inhaler is made of black, hard rubber, with two face-pieces.

The society then took up the subject for the evening's discussion—

"THE VARIETIES OF GOLD FOR FILLING TEETH."

Dr. McQuillen said that he had expressed himself so freely on different occasions on the subject, during the past few years, that anything he might say this evening must, to a great extent, be a repetition of what he had already given utterance to. He then referred to his lengthened experience and decided prejudice in favor of the use of gold foil, but that of late he had come to regard sponge gold with so much favor that he employs it almost to the exclusion of everything else. The facility with which it could be introduced into a cavity, or the lost portions of a crown could be restored, was dwelt upon. He said that he could introduce a filling of crystal gold much quicker than he could one of gold foil. It was an article, however, that had to be used with a great deal of care. If employed in large pieces, the gold does not become entirely condensed, and the operator has, to a certain extent, a spongy mass with no decided adhesion among the particles. Each piece should be quite small, and thoroughly consolidated, prior to bringing any more gold in contact with it. It was a matter of the greatest moment that the instruments employed in introducing the gold should be properly constructed for the purpose. The serrations should not be very deep or the points far apart from each other. As the points are liable to become blunted by use, it is advisable to have at hand means whereby they can be renewed. This may be readily accomplished by means of a thin Arkansas stone, ground to a knife edge on a corundum wheel; this introduced between the points readily sharpens them. The deep serrations and points, far distant from each other, are objectionable on account of their leaving deep depressions in the gold, which would not be filled up by the subsequent additions, and in this way a sort of honeycomb filling would be formed.

Dr. Breen's experience in gold filling is confined to Nos. 4 and 6 foil; uses the former most, of Dr. S. S. White's manufacture; has used Morgan's, but can manipulate best with the first.

Method of filling. Has prepared his gold in the form of cylinders for deep-seated cavities; then opens them from the centre and fills in with rope. In large approximal cavities uses the rope; in small cavities uses pellets.

Dr. Flagg uses gold foil and sponge or crystal gold; he prefers No. 5 foil for general use, and thought that if one became habituated to the employment of any one number, that was the best, as No. 4 was too light for heavy work (large cavities), and No. 6 was too heavy for small cavities; he used rope (cut up into $\frac{1}{8}$ or $\frac{1}{4}$ inch pieces), cylinders (folded and

broach rolled), in rolled pellets, tacks (pieces loosely rolled at one end, and very tightly twisted and pointed at the other end), ribbons, etc.; seldom annealed his foil, but very much preferred it fresh from the gold-beater's. Was formerly opposed to the use of sponge gold, but thought that his views were based upon the double foundation of a want of sufficient experience, and a willingness to take the experience of others as his guide. He had no such willingness now. He accepted statements in some directions upon the authority of others, but in connection with things pertaining to dentistry, he had been deceived and misled too often to admit even the most plausible statements into his category of facts without the testing of severe and long-continued trial. It was this method which enabled him, year after year, to arrive at conclusion after conclusion, but which compelled him to remain *uncommitted* upon everything which was new. He was not yet convinced that crystal gold was as good as gold foil against the walls of a cavity, and, therefore, *as yet* preferred foil in that position, but for the centres of plugs and for building on, he preferred crystal or sponge gold. Did not regard the "building up" of teeth with gold as evidence of such miraculous skill as some seemed to desire should be inferred, and would state to those who had not tried it, but who had wonderingly gazed upon such operations, that they were *easy* of performance, and particularly so in accessible positions (as incisors, cuspids, and bicuspid), only requiring time and patience, a good article of crystal gold, and good plugging instruments. He preferred "Watts' No. 2." In preparing cavities he endeavored to make good retaining points, and was careful *not to so place the gold in them as to retain and overhang at the same time*. He advocated the use of oxychloride of zinc filling material in connection with gold in large cavities, and where the walls of dentine or enamel were too thin, so as either to permit a yellowish color from the gold, or to preclude sufficient strength for masticatory purposes.

He urged the maintenance of dryness in connection with gold filling, and earnestly recommended the use of the rubber dam, stating that although to some it might be difficult of application at first, yet, as in very many other things, "practice made easy," and, when well adapted, he could but say that he regarded it as one of the most valuable suggestions in the range of operative dentistry.

Dr. James Goodwillie has been in the habit of using and prefers Dr. S. S. White's No. 5 adhesive gold foil.

Dr. Stellwagen had recently tried gold prepared by several different parties, and each time had returned to that of Abbey & Son, using No. 4 non-adhesive, believing that, in his hands, it was more economical than any other that he had tried, although he had been forced to pay thirty-five per cent. more for it than that of some of the other preparations. For

will not be regarded as an essay upon the subject. I expect I am but one of many who practices the operation, and I have not the merit of being the first to draw attention to this matter or to discover the operation. Far back in the transactions of the Odontological Society, you will find a paper by Mr. Woodhouse and Catilin. * * * * *

I remain your friend,

JOHN TOMES.

On motion of Dr. Garretson, the picture of Mr. Tomes was ordered to be framed at the expense of the society.

The election of officers for the ensuing year was then entered upon, and resulted in the unanimous choice of the following gentlemen :

President.—James M. Harris, M.D., D.D.S., Philadelphia.

1st Vice-President.—J. Foster Flagg, D.D.S., Philadelphia.

2d Vice-President.—J. L. Suesserott, M.D., D.D.S., Chambersburg, Pennsylvania.

Corresponding Secretary.—J. H. McQuillen, M.D., D.D.S., Philadelphia.

Recording Secretary.—Thomas C. Stellwagen, D.D.S., A.M., Philadelphia.

Treasurer.—William P. Henry, D.D.S., Philadelphia.

Librarian.—William A. Breen, D.D.S., Philadelphia.

Executive Committee.—William P. Henry, D.D.S., Ambler Tees, D.D.S., and George W. Ellis, M.D., D.D.S., Philadelphia.

After a few remarks by the President, Dr. Harris, the society adjourned, to meet in the same place on Monday evening, June 4th, 1866.

DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

S. C. BARNUM read a paper on Vulcanite Plates, of which the following is an abstract :

Takes his impressions in plaster, placing some on the end of his finger and plastering it carefully in the roof of the mouth before introducing his cup. Thinks this course has a tendency to prevent air-bubbles in the impression. To lessen the effects of expansion, he prepares and fills his impression *immediately*.

To prevent the model from adhering to the impression, he employs a solution of soap instead of varnish. Immediately after filling the impression, he turns the cup upside down upon the bench and extends the

plaster some two inches beyond the "heel" of the cup to form one-half of the articulator. Has more confidence in this than in the metallic articulators generally employed. Has great difficulty in getting patients to bite properly into his articulating wax. The selection and grinding of the teeth and the flasking of his case are as commonly practiced. Is careful not to get his flasks too warm before separating, as the wax is liable to melt and penetrate the plaster to the detriment of the rubber. Removes all the wax he can with an instrument, and then pours hot water into the flask to melt and wash out the balance.

To prevent the rubber from insinuating itself between the blocks, he inserts plaster moistened with a solution of silicate of soda or potash.

To prevent the plaster from adhering to the rubber, he varnishes the model with a thin solution of collodion. A thick film has a tendency to adhere to the rubber and make it too dark.

Cuts "wells" and "canals" for the surplus rubber, instead of compelling it to escape from the flask, as formerly. Has less trouble now.

Partial pieces for the upper jaw he generally makes of gold—those for the lower jaw he makes of rubber.

J. H. Burras read a paper upon the subject of Pivot Teeth, in which he spoke favorably of the old method of employing hickory pivots. Had seen teeth so mounted perform excellent service for many years.

G. A. Mills, in a paper read before the society, admitted that his experience with pivot teeth had been quite limited, and his prejudices rather against the method on account of the bad odor of many cases that had fallen under his observation, but he was inclined to believe that with a good root, favorable occlusion, and great care in manipulation, the objections he had noticed might be overcome.

C. E. Latimer, D.D.S., showed specimens of plate crowns mounted on roots by means of Wood's fusible alloy, and explained his method of manipulating. (See his paper on this subject in DENTAL COSMOS for January, 1866.)

B. W. Franklin has seen pivoted crowns do excellent service. Three or four folds of gold foil should envelop the compressed hickory pivot, as by this means the fluids of the mouth are excluded.

John Allen, D.D.S., covers the wooden pivot with two or three layers of foil. Related an instance in which he inserted a pivot crown upon a root that had been transplanted from another jaw to that of his patient many years before.

J. S. Latimer, D.D.S., could not boast of a very extensive experience in inserting pivot crowns. He had been pleased with some cases in which he had set plate teeth, tipped with gum, soldered to a platinum plate as large as the filed end of the root. To this plate a gold wire is soldered, which passes into a cylinder set in the root.

The tip of gum conceals the joint. This method is especially valuable when the roots have become denuded on their labial surfaces. Was inclined to think well of the method suggested by his brother, for the reason that by it the end of the root is covered and protected from acids.

N. W. Kingsley thought well of compressed hickory for pivots. Spoke of a case in which he had reset a pivot crown that had been worn thirty-two years! Can and does grind his crowns so nicely to the root that saliva is excluded; hence he does not like the interposition of foil. If the joint is imperfect, he makes it good with oxy-chloride of zinc.

If caries has made the canal funnel-shaped, he gets parallel walls further up, inserts his hickory pivot, and fills about it with the oxy-chloride.

With all due respect for the gentlemen who were restoring considerable portions of the crowns of anterior teeth with gold, he begged to dissent from their taste. He preferred a pivoted crown to a golden one.

C. P. Fitch, M.D., diagnoses carefully the health of the root and the occlusion. If the pulp had died of its own accord, he would not set the crown immediately, except in a temporary way, as treatment would doubtless be required.

In one case, at least, he has filled a canal, made conical by caries, with Wood's alloy, and drilled through it to make way for the pivot of hickory. Spoke of a case in which he set a gold cylinder in the root and covered the end of the root with adhesive foil.

Called attention to the method detailed by Professor Richardson in his work on Mechanical Dentistry, by which the crown is attached to the pivot by the use of vulcanite.

Would not build up the crown of a tooth with gold unless he could make it strong, and even then would defer to the desire of the patient, if a preference should be expressed for a pivoted crown.

T. H. Burras explained that his objection to winding foil upon the wooden pivot is founded on the fact that the gold will crumple and be displaced from the pivot during the process of insertion.

N. W. Kingsley said he was enabled to exactly adjust the crown to the root by putting some color on the stump, which, on contact of the crown, indicated where to grind.

At a later meeting, the subject of Dental Instruments being before the society,—

Frank Abbot presented and explained the uses and advantages of his pluggers. Also commended Latimer's broaches. If a broach break off, leaving a portion in the canal, he applies some tincture of iodine on a pellet of cotton, seals the cavity with wax, and, a day or two afterward, finds the steel has been entirely oxidized. Had tried Footes' automatic

mallet, and believed it would prove a valuable adjunct, especially for those who have not the constant services of an assistant in malleting. Was inclined to think unfavorably of the modification of the hand mallet presented by Dr. Colburn. (This is the ordinary mallet, with a hole bored into one face of the head into which a piece of rubber tubing is inserted. Into this tubing the screw of a separate face is inserted, so that the force of the blow is received and broken upon the rubber; the object being to break the shock received by the tooth.) He wanted just such a blow as the mallet of ordinary construction gives, but the weight of the instrument should not be too great.

His patients make no complaints of his mallet. S. S. White has some small and very neat mallets at his depot in this city, which it would be difficult to improve.

G. F. J. Colburn, D.D.S., had been led to search for some expedient for overcoming the shock which some teeth feel from the ordinary mallet. From his experience with the device he had presented to the society for their consideration, he had been led to believe that he had found the object of his desire. Patients who complained of the ordinary mallet were greatly pleased when the spring face was employed. He believed it equally efficacious with the ordinary mallet in packing gold, but a harder blow must be struck.

G. A. Mills exhibited mallet-pluggers, made for him by Mr. Biddle, with "socket handles," silver-plated, into which he had inserted points of his own devising, with some from Atkinson, Abbot, Latimer, and others. The handles were neat and cleanly, keeping bright without difficulty. He had very little trouble with the irritation of the tooth caused by the mallet, of which the speaker next preceding him complained.

G. F. Foote, M.D., acknowledged that the serrations of the points he had on another occasion exhibited with his automatic mallet were wrongly constructed, but he would soon have something that he had no doubt would be unobjectionable, for he was consulting and getting the ideas of most of the gentlemen who had improved the points of pluggers. He hoped gentlemen would freely express their opinions. Exhibited some drills invented by Dr. Scranton, of Burlington, Vt.

N. W. Kingsley had been in the habit of making the final condensations of gold with plugging forceps in cases where those instruments were admissible. Uses a good deal of crystal gold, but does not anneal it. Is sometimes compelled to resort to pellets and cylinders to avoid getting the gold wet. The abundance of saliva will not always admit of the slower and ordinarily better way. Was anxious for more light on making and tempering instruments.

F. H. Clark had worked with steel since he was some fifteen years old. For enamel chisels, he hardens and does not draw or temper, but draws

to a "straw" for excavators, and for pluggers he leaves the serrations dark straw, but draws the shank to a deep blue.

B. W. Franklin commended Abbot's bayonet pluggers. Anneals his gold at a lower than red heat, leaving it soft but adhesive. We want a quick, sharp blow, with a light mallet. If a tooth is loose so as to be unable to bear the action of such a mallet, he supports it with wedges placed between the teeth so as to distribute the blow among several teeth. Did not think we could temper well by relying upon the color. He had discovered that an instrument heated to a red color and then carried down lower in the flame so as to become coated with soot, would be so protected from the currents of air and prevented from radiating its heat as to allow it to cool quite gradually and be left very soft. For cutting instruments, he hardens, then places in a sheet-iron pan, and covers them with fish oil or sweet oil. Heat is then applied until the oil ignites, when the oil and instruments are set aside to cool. A second operation of the same sort draws them to a spring temper.

F. H. Clark said that if one strike a bolt upon its end with a relatively light hammer, the effect is a riveting at the immediate point struck; if the weight of the hammer be increased, the bolt will be increased in diameter at a greater distance from the surface struck; while a still heavier hammer bends the bolt or pushes it from its position. There should be a definite relation between the body bearing the momentum and the body receiving it.

G. F. J. Colburn, D.D.S., said he had given some attention to the idea of employing diamonds for pointing drills, and he hoped yet to succeed in getting something in this direction that would be valuable.

J. S. Latimer, D.D.S., called attention to a device employed by Wm. H. Allen, for admitting the use of the mallet in filling loose teeth.

A bar of lead, of suitable size, is placed upon the opposite side of the tooth, to that against which the stroke is made. By this means the lead receives and absorbs the force of the blow.

CORRESPONDENCE.

ANAESTHETIC SPRAY-PRODUCER.

BY W. H. WAITE, D.D.S., LIVERPOOL, ENGLAND.

A paper read before the Odontographic Society of Pennsylvania.

GENTLEMEN:—I have the pleasure to acknowledge the receipt of the certificate of my election as a corresponding member of your society; and in doing so, permit me to express my deep sense of the honor you thus confer upon me. I greatly rejoice in such organizations, believing that

the intercourse, discussion, and instruction they are the means of encouraging, tend to increase the knowledge, to cultivate the talents, and enhance the usefulness of all who belong to them; while, at the same time, they afford evidence to others, of the zeal and activity of the members of our honorable and useful profession.

In thus making my bow upon entering your society, I have to regret that the intervention of three thousand miles of ocean will preclude the possibility of personal presence with you, and oral participation in your discussions: and this is the more a privation to me, inasmuch as up to the present time no similar organization has been set on foot anywhere within reach of my present location. This disadvantage is mitigated partly by the opportunities presented through the pages of the DENTAL COSMOS, for reading what takes place among you; but it also puts me in a position to crave your indulgence on account of the paucity of my communications. Be assured, however, that to the utmost of my power, I shall endeavor to discharge the duties of a correspondent faithfully, and when from lack of ability or opportunity I fail, your forbearance must be my refuge.

It gives me much pleasure at this my first appearance before you, to be able to offer to your notice an instrument, which has recently been introduced to the medical profession here, for the purpose of producing local anæsthesia. Dr. Benjamin Ward Richardson, the inventor, is already known to you as the writer of a course of Lectures on the Teeth in their relation to Medical Practice, delivered before the College of Dentists of England, in the session of 1858 and 1859; and which have been adopted as a part of the recognized text-books of your dental colleges.

The circumstance thus noticed has no significance in itself, beyond that which it obtains as a distinctive mark, by which his identity as the discoverer of the "Anæsthetic Spray-Producer" may be clearly established.

At a meeting of the Odontological Society, held February fifth, Dr. Richardson introduced his instrument to the members of the society as follows: "The process for producing local anæsthesia, which I have the honor to present to the Odontological Society, may be called 'The process for producing anæsthesia by narcotic spray,' and the instrument on the table, 'The anæsthetic spray-producer.'

"The principle of the process is a combination of extreme cold with a volatile anæsthetic fluid. The action of the process in a physiological point of view is very simple. In the first instance, the spray, from the extreme degree of cold it causes, acts by extracting force from the part of the body to which it is applied, and afterward, when the nervous filaments of the parts are exposed, by preventing the conveyance of force through the nerves.* Sensation is the conveyance of force or motion

* Query.

from the extreme parts to the brain. The motion is communicated by the blood in the form of heat, it is communicated to the nervous filaments, and by them is conveyed to the sensorium. This is passive sensibility. When we irritate a nervous fibre, as by a cut, we communicate more motion rapidly along that fibre and cause pain. This is active sensibility. To remove sensibility, therefore, we must adopt one of these processes: we must remove or render inert the sensorium; we must stop the evolution of force generally by arresting the oxidation of the blood—or we must rob the body locally of its force, beyond that with which it is constantly being renewed. We see the first of these in action, in cases of pressure on the brain, as from injury or effusion of blood; we see the second whenever we produce general anæsthesia by charging the blood with chloroform, or other analogous anæsthetic; and we see the third, when, by means of extreme cold, we rob the local part of the force that has been brought to it by the blood. The fact that cold applied locally to any part of the body removes the sensibility of the part has been known for ages; but it remained for my friend, Mr. Arnott, to demonstrate that cold might be turned to account in surgical operations, and to invent the means of application by the ice and salt-bag. On this theory, I invented various plans for insuring the combination of cold with a narcotic. I could, however, discover no satisfactory plan until a new line of thought was suggested to me in the spray apparatus, or atomizer of liquids."

After detailing several forms of instrument devised prior to the present one, and pointing out the faults of each, Dr. Richardson proceeded to describe the apparatus as follows: "It consists simply of a graduated bottle to hold the ether; through a perforated cork a double tube is passed, one extremity of the inner part of which goes to the bottom of the bottle; above the cork a little tube, connected with a hand-bellows, pierces the outer part of the double tube and communicates by means of the outer part, by a small aperture, with the interior of the bottle. The inner tube for delivering the ether runs upward nearly to the extremity of the outer tube. Now, when the bellows are worked, a double current of air is produced, one current descending, and pressing upon the ether, forcing it along the inner tube, and the other ascending through the outer tube, and playing upon the column of ether as it passes through the fine jet. By having a series of jets to fit on the lower part of the inner tube, the volume of ether can be moderated at pleasure; and by having a double tube for the admission of air, and two pairs of hand-bellows, the volume of ether can be increased with pleasure, producing a degree of cold six below zero." (Dr. Richardson here directed the spray on a thermometer tube, bringing the mercury to zero. He then froze water in half inch test-tubes, sending them round among the members.)

"When the ether spray thus produced is directed on the outer skin, it is rendered insensible within a minute: but the effects do not end here. So soon as the skin is divided, the ether begins to exert on the nervous filaments the double action of cold and of etherization, so that the narcotics can be extended deeply to any desired extent. Pure rectified ether used in this manner is entirely negative, it causes no irritation, and may be applied to a deep wound without any danger. I have applied it direct to the mucous membrane of my own eye, after first chilling the ball with the lid closed.

"For all superficial operations on the skin, this method of producing local anæsthesia offers everything that can be desired. Further, the ether being quite innocuous, it admits of being applied to an incised wound, and so narcotism may be carried to a considerable depth.

"The first time the process was applied at all was in a case of extraction on December 11, 1865. The patient was a lady, who required to have five front teeth extracted. I had previously administered chloroform to this lady for tooth extraction, but the inhalation had produced so much irregularity in the action of the heart, and other disagreeable symptoms, that I considered it inadvisable to repeat chloroform. Mr. Peter Matthews performed the extraction. On directing the spray over the gum of the left central incisor, we observed at the end of fifty seconds that the gum had become as white as the tooth itself, and quite insensible. I then directed the vapor on the tooth itself for twenty or thirty seconds more, and on the patient intimating that she did not feel, I suggested to Mr. Matthews to proceed.

"He extracted a very firm tooth, without the slightest expression of pain. The process being continued in the same manner, he extracted three others with the forceps. The fourth gave way and had to be removed by the lever: but in all cases the result was equally good. Not a drop of blood was lost—there was no painful reaction, and the healing process proceeded perfectly. Our patient told us that in two of the extractions she felt nothing; that in one it seemed as if the jaw altogether were being pulled downward, but without pain—that in another she was conscious of a kind of wrench or loosening, but without pain, and that the introduction of the lever was attended with a momentary dull ache, just perceptible. On the whole, the process was quite as painless as when she took chloroform."

Several other experiments are detailed, and summed up thus: "From all these experiences we gather clearly as a fact, that by the process I have described, extractions of teeth may be performed absolutely without pain. Such failures as have occurred were due simply to faults in carrying out the details. These will be removed by experience and improved apparatus. The first step in this direction is the making a spray-pro-

ducer with a double jet. By this means the spray can be directed on each side of the tooth and gums at one and the same time.

"The process is much more easily applied to the upper than the lower teeth; because in the case of the lower teeth the ether accumulates between the jaw and the cheek. To meet this, the space should be nicely padded with sponge or cotton-wool, so as to take up the ether. The spray should be directed at the lower part of the tooth over the gum; it should be directed slowly at first, so as to accustom the patient to the cold, then sharply. It is not necessary to extend the application beyond a minute.

"The ether must be pure rectified, having a boiling point of 96° Fahr. Methylated ether does not answer: it causes much pain and after-irritation. Chloroform is objectionable for the same reason.

"It should be remembered that the narcotism produced is very transient, so that the operation must be done quickly. There is no danger of sloughing from reaction He could not too strongly enforce the importance of having pure ether. In conclusion, Dr. Richardson said he would specially direct the attention of the younger members of the profession who were engaged in chemical studies to this important point, that if they could discover a fluid or pure hydrocarbon that would boil at 75° or 80°, instead of 96° Fahr. (the boiling point of ether), there was no operation in surgery, however deep, that could not be performed by his process, thus superseding chloroform with all its dangers."

In this apparatus, then, according to Dr. Richardson's statement, we have a means of arresting the course of communication between the part affected and the sensorium. We have all no doubt observed, that patients under the influence of ether or chloroform by the inhaling process, frequently exhibit muscular contortions of the face and limbs, during an operation, as if suffering intense pain; but on the return of consciousness, the verdict is that no pain has been felt. Only a few weeks ago, I had a patient, who, while under the influence of chloroform, endeavored to seize my hands, in order to prevent the operation, and who, after the removal of each tooth, raised both hands to press his ears, indicating, *apparently*, a consciousness of pain and an effort to relieve it; yet, on recovering from the influence, this patient put his fingers into his mouth to ascertain if his teeth had actually been removed, so utterly oblivious was he of what had taken place. In this and similar cases, it would appear that there is no interference with the communication between the part affected and the seat of volition, nor again between the seat of volition and the muscles of the extremities. In other words, general anæsthetics appear (in such cases) to produce no effect on the circulatory force of either the sensor or motor nervous trunks. Where then precisely is their influence produced? Is it upon that subtle faculty by which we

apprehend, or become sensible of that which is going on at any part of our organism? or is it (as some would have it) upon the retentive faculty that a sort of temporary paralysis is inflicted, arresting for the time the power by which we can recollect the incidents and sensations of the past?

Dr. Richardson asserts that "by charging the blood with chloroform, we stop the evolution of force generally by arresting the oxidation of the blood. Sensation," says he, "is the conveyance of force or motion from the extreme parts to the brain." It is quite refreshing to have a clear definition of so indefinite a term as "sensation," but unfortunately for myself, I am not prepared to accept it. What we call sensation, probably results from "the conveyance of force or motion from the extremities to the seat of consciousness," wherever that may be; but may not the force be conveyed, and yet there be no sensation? If by administering chloroform, "we stop the evolution of force," which would be "conveyed from the part to the brain," by what means is the impression of injury conveyed to the brain, and the intention to check or relieve the injury conveyed from the brain to the muscular system, as evidenced in the case referred to? Most respectfully and humbly dissenting from the views expressed by Dr. Richardson, I would with equal respect venture to suggest to the members of the Odontographic Society, that in *general* anæsthesia (as it is termed) produced by the inhalation of chloroform or other similar agents, we depend for success upon the temporary suspension of the faculty of appreciating the intimations which are conveyed to the seat of consciousness, notwithstanding that such impressions produce (in many cases) their normal effects, of exciting certain of the motor nerve trunks, as may, by their command of certain muscles, be able to offer some resistance to the encroachments of the invader. On the contrary, in *local* anæsthesia, produced by congelation, spray, or whatever means, we depend for success on the arrestation of the communicating force, so that no intimation of what is taking place is allowed to reach the seat of consciousness. Should this view approach to soundness, we see how much more simple and agreeable a method the latter is.

My own experience with this instrument is very limited, but I certainly consider its effect to be eminently satisfactory in producing a very large amount of insensibility in the part to which the spray is applied. It will be gratifying to hear the opinions of gentlemen so conversant with the subject of anæsthesia in relation to dental surgery as the members of the Odontographic Society—and I await the expression thereof. Meantime the results of personal observation will be duly recorded.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"Rate of Transmission of Sensation and Volition along the Nervous Structures.—A very large audience assembled at the Royal Institution to listen to the remarks of the learned PROFESSOR EMIL DU BOIS REYMOND, which were interspersed with a series of elegant experiments in illustration of the propositions enunciated.

"The Professor began with some general observations on the use of the nervous system in bringing us into relation with the external world, and rendering us capable of appreciating the manifold physical phenomena which go on around us. He likened the nerves to telegraph wires, for without any apparent external effect which was appreciable to our senses, a something was transmitted along them in obedience to certain stimuli, the transmitting cords being, however, like the wires, necessarily entire. The Professor then showed that the effect of the application of stimuli to nerves in connection with muscle, was contraction of the latter. This was shown by a charming experiment—one end of the muscle of a frog, in connection with its nerve, was made a fixed point; to the other was attached a thread running over a pulley, and suspended from the thread was a little pailful of shot and a movable disk. When the muscle was made to contract, the disk described the sweep of a half circle, and the little pailful of shot was raised. The next step consisted in showing that the analogy between the telegraph wires and the nerves as transmitting agencies was not a perfect one. A nerve was connected with two electrodes, and its muscle with a disk movable by the shortening or contraction of the muscle as before; at one part a string was placed ready for tying; on sending a current through the nerve, contraction ensued and the disk moved; the ligature was then tightened, and the bruised part of the nerve was found to be incapable of transmitting the excited nerve force, and no contraction ensued. The inference drawn was this—that a certain something traveled along the nerve; if it were only electricity it would have skipped over the ligature.

"The Professor then turned to the question of the velocity with which this *nervous agent* traveled from brain to muscle, or, *vice versâ*, from the outer surface to the brain itself. In the ordinary occurrence in which volition and sensation are concerned, we do not, for instance, appreciate any delay between the reception and the perception of a sensation. In the exercise, too, of the faculties of the special senses, the same holds good. We fancy we see and hear, as it were, instantaneously, coincidentally with the impression made by any given object, but this is probably an error. Experiments with heat and light have shown that there is a difference, but it is such as we do not generally notice; a delay of about one-tenth of a second is the least degree of time that we can appreciate.

"There is a delay in the transit of nervous impressions, though we are not usually aware of it. Only fifteen years ago, Professor du Bois Reymond observed, Müller, in his lectures, was wont to declare that we should never be able to make out the rate of transmission, because we had so small a compass to deal with, and that in the human body we could not

get space for the purpose. The lecturer proceeded to show that the rate of transmission through different lengths of nerve was really appreciable by artificial means. He contrived an apparatus by which the exact commencement and ending of the time and the current were registered. He fixed the end of a muscle, and from the other supported a lever by a table at such a height that the muscle itself just supported the lever without being put upon the stretch. The nerve was then put in connection with a secondary coil. If the muscle contracted it would act on the lever, and this being lifted breaks the current by the first action of the muscle. The whole was connected with a galvanometer, and when the current was excited it was deflected slightly. A weight was then attached to the lever, so that a greater contraction—in other words, more time—was required for the muscle to contract so as to lift the lever sufficiently, and the deflection of the needle, in consequence of the long-continued current, was greater than in the previous experiment. The next point was to show that a stimulus applied to two different parts of the nerve more or less distant from the muscle was appreciable on account of the comparative difference in the distance which was necessarily traveled over in the two cases. Professor Reymond used a myographion, which registered a certain curve corresponding to the muscle in action, and he stimulated the nerve near and at a greater distance from the muscle. He got two different curves, which showed the variation in the speed of transmission due to the varying length of nerve through which the stimulus traveled. The following rates are taken from a table exhibited :

	Millimetres in one second.
Electricity.....	464,000,000
Light	300,000,000
Sound in iron	3,485
“ water.....	1,435
“ air	332
Cannon-ball	552
Wind	1—20
Eagle's flight.....	35
Greyhound or racehorse.....	25
Nervous agents.....	26—30
In throwing a stone 24 in. high.....	21.9
Muscular contraction .....	.8=1.2
Arterial wave	9.25

“From this table it appears that a man can move his foot, an eagle can fly, a greyhound or racehorse run, as fast as the nerve action travels. The lecturer observed that it takes about a second before the penetrating harpoon which strikes the tail of the whale is felt, and another second before the mandate from the brain arrives at the creature's tail with orders to upset the boat. The velocity in man can be measured. Schelske has shown that the velocity in a living man is not greater than that of the nervous agent in the frog, about 80 feet per second.* More than this, the time that thought and other mental operations take to travel has been measured. By means of certain specially constructed apparatus, a certain signal can be produced to indicate the occurrence of sensations. For example, a sensation is felt; this is answered by the production of a signal.

* In this estimate no allowance seems to have been made for difference in organization. The rate of transmission of nervous influence will necessarily vary according to temperament, it being much more rapid in the nervous than in the lymphatic temperament —Z.

Now, it is very curious that if the answer required be known beforehand, the time occupied in the transmission is shorter than when the answer is unknown. The following table shows this. For example, the same signal is given, but in one case the face is touched, and you know it will be; in another the foot is touched, and you are not aware of it beforehand.

"Time required for answered signal, as given by the sense of touch—

	Second.
Place of body known.....	·204
" unknown.....	·272
Eye—color known.....	·201
" unknown.....	·355
Ear—sound known.....	·215
" unknown.....	·307

"The lecture concluded with a reference again to the fact that the transmission of nervous influences was not like that of the electric fluid through a telegraph wire, chiefly because, as in the first experiment, a ligatured nerve ceases to transmit, and secondly, on account of the difference in the rates of transmission of the two kinds of influence, as shown by experiment—the one, nerve force, about 26 millimetres a second; electricity, 464,000,000 in a second."—(*Med. Times and Gaz.*)

Hæmostatic and Caustic Ether Spray.—*Styptic or Hæmostatic Ether.* By BENJ. W. RICHARDSON, M.A., M.D., F.R.C.P., Senior Physician to the Royal Infirmary for Diseases of the Chest.—"My researches on the production of local anæsthesia by means of ether spray have led me to invent a few new compounds of ether which cannot, I think, but prove useful in practice.

"*Hæmostatic Ethers.*—In observing the influence of the cold produced by the dispersion of absolute ether during operations, nothing has struck me more than the effect of the cold in immediately stopping the flow of blood. For a time, cold alone, when carried to its fullest degree, prevents all venous and capillary hæmorrhage, and even the hæmorrhage from small arterial trunks. After a time, however, as reaction returns, and the vessels relax under the influence of heat derived from the renewed circulation, there is bleeding, which, if a wound be closed too quickly, is a cause of after-trouble. The observation of the immediate effects of cold led me to think that if they could be supplemented by a styptic which would spray evenly with ether, and which would take up the constringing action when the vessel commenced to relax, an important desideratum in both medical and surgical practice would be supplied.

"*Xylo-Styptic Ether Spray.*—With this object before me, I requested Mr. Robbins to make for me a solution consisting of absolute ether, having a boiling point of 92° Fah., charged to saturation at a low temperature with tannin, and afterward treated with xyloidine, a little short of saturation. The compound, made with much care, came out well. It ran easily through the spray tube without blocking; it produced good local anæsthesia, and it possessed an agreeable odor.

"In order to test to the extreme the effects of this preparation as a styptic, I took sheep's blood, removed all the fibrine previous to coagulation by whipping, and then let the blood remain exposed to the air for two days to insure partial decomposition. In this way the blood was rendered nearly as fluid as port wine, and in the most unfavorable condition for being transformed into clot. A few drachms of this blood were

now placed in a saucer, the saucer having been warmed to the temperature of the body. The spray of the styptic ether was then directed upon the blood from a full-sized spray tube, and in five seconds the whole mass of blood was so thoroughly solidified that the saucer could be turned upside down without any escape of fluid. The blood, which had previously presented the odor of putrefaction, was also deodorized, and remains quite inodorous at this date—ten days after the experiment. The blood sets in a firm leathery consistence, covered on its upper surface with a fine whitish layer, with a bright vermilion color beneath.

“These are the effects of the styptic ether on blood, the spontaneous coagulability of which has been lost, and I had the pleasure of showing these effects at the College of Physicians on Friday last, during a lecture on heat and cold in the treatment of disease; but these effects are trifling when compared with what takes place on blood newly drawn, and which contains fibrine. In this case the process of coagulation under the influence of the spray is the work, I had almost said, of a second.

“When this spray is directed on an open bleeding living surface, the primary effects are those produced by the cold—namely, the condensation and whitening of the tissues. If blood be flowing, it solidifies, and when the parts relax, new blood that may ooze up enters the solid blood as though it were a sponge, quickly solidifying by coagulation, and stopping further flow.

“The applicability of this process for the arrest of hæmorrhage will occur to the mind of every practitioner. The substances used in the compound are innocuous, and the combined influence of the cold and the styptic are immediate, and so decisive that I can scarcely imagine any hæmorrhage they would not control. I have not had an opportunity of testing the point, but I have no doubt, from the influence of the styptic on the decomposing albumen of defibrinated blood, that even in those cases of hæmorrhage where the blood is preternaturally fluid, the styptic spray would arrest the hæmorrhage entirely. Where the blood contains fibrine in a natural condition, I cannot imagine a case in which the fluid would not prevent exudation.

“The essential elements of this process are three in number:

- “1. The immediate constricting effects of cold on the blood-vessels.
- “2. The chemical action of the solution on the fibrine and albumen of the blood.
- “3. The extreme mechanical fineness of distribution of the fluid on the bleeding surface.

“The styptic ether can not only be applied to open wounds on the skin, but to hæmorrhage after the extraction of teeth, and, by means of a uterine tube, to hæmorrhage arising from cancerous disease of the uterus or other cause. It might also be applied to the rectum in cases of hæmorrhage from piles.

“The apparatus required for this styptic ether is mechanically the same as for ordinary ether—that is to say, my spray tube with Dr. Clarke’s hand-bellows. The tube, however, requires to be made of different metal from that ordinarily in use for local anæsthesia.

“*Ferro-Styptic Ether.*—I have tried other experiments with the persalts of iron, which are more or less soluble in ether, especially the perchloride, and these one and all produced, as a styptic ether, rapid coagulation of blood. Solutions of iron salts in ether are not, however, more effective than the ether I have already described; and as they destroy

the tube rapidly, act upon clothing injuriously, and do not so thoroughly deodorize, I do not think they are in the main so practical.

"The styptic ether, containing xyloidine and tannin, will keep ready for use any length of time, as there is nothing in it to undergo decomposition; and as very small quantities of it are required, it will become, I trust, of standard service to the medical practitioner. It would be of great use also to surgeons on board ship, and particularly to army surgeons. In case of warfare it would be exceedingly useful on the battlefield, as under the instruction of the surgeon it could be used by an orderly, so as to prevent hæmorrhage instantaneously in the case of flesh wounds. It would also form a useful addition to the medical cabinet of travelers, who by necessity are removed from the direct succor afforded by medical art.

"I have invented some other ether compounds—namely, a caustic ether, an iodized ethereal oil, and an ozonized ether, to which I will refer in a future number."—(*Med. Times and Gazette.*)

Local Anæsthesia.—The Birmingham correspondent of the *Dublin Medical Press and Circular* states that "in the extraction of teeth Dr. RICHARDSON'S process has been found to answer extremely well, complete insensibility having been in all cases obtained. The opinion here is that in all minor operations at least, the danger of chloroform can henceforth be avoided by the use of this highly efficacious invention."

Animal Grafts.—The possibility of engrafting one part of a living animal on another portion of the same animal, has long been recognized as a physiological fact, and underlies the whole practice of 'plastic surgery.' A lost nose or an unsightly opening in the face may be, in a great degree, remedied, at least as far as appearances go, by such an operation. But in these cases the old connections are not wholly destroyed until the new ones are established. The skin out of which the substitute for a nose is made is allowed to retain an attachment to, and derive nourishment from the forehead until it forms a union with the parts with which it has been newly brought in contact, and only then its old connections, becoming unnecessary, are divided. Completely severed fingers sometimes unite when carefully brought together, and teeth which have been knocked wholly out will reunite with their sockets when replaced. Individual tissues, as parts of a muscle, nerve, etc., have been, from time to time, transferred from one animal to another, where they have formed an organic union and lived.

"The recent experiments of Bert in grafting, more than eighty in number, and for which he has received a prize from the Academy of Sciences in Paris, are the most complete hitherto recorded, and some of his results show a greater persistence of life in separated parts than had been previously supposed possible. They consisted chiefly in transplanting the tail or other parts of one animal into or beneath the skin, or into the cavity of the abdomen of the same or of another animal. The following will serve to illustrate the nature, as well as some of the results of Bert's observations. The tail of a rat was cut off, a portion of its end was deprived of its skin, and then inserted into an opening on the back and secured in place; a complete adhesion of the parts followed, and the tail was sufficiently nourished in its new position. In another case a piece of tail 2.5 centimetres long, from which the skin had been removed, was in-

serted under the skin of another rat, so as to be completely covered in; the wound soon healed. Two months afterward, by manipulating through the skin, one of the vertebræ of the transplanted part was fractured; about three months from the beginning of the experiment the rat was killed, and the fragment of tail had not only formed an organic union with the surrounding parts, but had grown from 2.5 to 9 centimetres in length, and the fractured portions had united, showing that its life was fully maintained. In like manner, the foot of one rat, from which the skin had been removed, was inserted under the skin of another, where it formed a union and increased considerably in size.

"The following experiment has an important bearing on the physiology of nerves, since it adds another fact in evidence that nerves are more indifferent as conductors than has generally been supposed. The prevailing view has been that sensitive nerves only conduct impressions inward to the nervous centres, and motor nerves from the centres outward. The curious experiment of Vulpian, though as yet it has not been often repeated, tend to show that this is not true. He divided the motor and sensitive nerves of the tongue, and, crossing them, united the ends of the first with those of the second. After the union was complete, he was able to excite muscular contraction by stimulating the sensitive nerve, which readily transmitted impressions made upon it to the motor nerve. It will be seen that in this case the sensitive nerve acted in a direction opposite to that in which it ordinarily acts. Bert engrafted the tip of a cat's tail into her back, and, after the union was completed, severed it at its base, so that it then hung from its tip, and received its nourishment in a direction the reverse of the natural one. The sensibility of the tail was at first destroyed, but at length returned after a union had been formed between its nerves and those of the body. When it was pinched she defended herself in the usual way. Here, too, the nerve transmitted its impressions in a direction the reverse of the natural one, the tail having been turned end for end.

"The time for which a part may retain its vitality after being separated from the body was also investigated, and, if Bert's observations are to be trusted, is much longer than has been supposed hitherto. Two young rats had each a piece of its own tail four centimetres long, and an equal piece of the tail of another and adult rat, engrafted into its body, after the parts had been detached from their living connections for twenty-four hours; during this interval the parts were kept in a glass tube inverted over water. They formed a union in their new places, and the immature tails increased in size. Successful grafts were made in other cases after the separation had lasted, in one instance, for twenty-six hours, in another three days, and in another eight days, the respective tails being inclosed during these periods in tightly corked tubes, and kept at a moderate temperature. He has shown, by a series of experiments, that the maintenance of a steady and moderate temperature during the period of separation is important. In parts kept at a temperature of from 50° to 54° F., the vitality persisted for several days; at 68°, for seventeen hours; and at 86°, only seven hours and a half. That the parts had fairly formed a living connection in the above instances was shown not only by their adhesions, but by the aid of injections, which proved that the blood-vessels of the body and the graft communicated with each other.

"Bert has not been successful in engrafting parts of a given animal on to another of a different genus."—(*The Nation*.)

Vicarious Menstruation.—"The subject of MR. D'ANDRADE's case was a stout, healthy Parsee lady, aged eighteen. She had menstruated regularly from thirteen to fifteen and a half, when catamenia became first irregular, then ceased, being replaced by bleeding at the gums and nose, and vomiting of blood. Menstruation returned; no pregnancy. Mr. d'Andrade observed blood to ooze from the healthy skin of the left breast and of the right forearm. The blood exuded showed red and white globules under the microscope. The skin-hæmorrhage recurred every month or two. Subsequently blood oozed from the forehead."—(*Trans. of Med. and Phys. Soc., Bombay, and Dublin Med. Press.*)

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"Case of Impaction of a Plate of Artificial Teeth in the Pharynx during a Period of Five Months. By DR. GEOGHEGAN, one of the Surgeons of the City of Dublin Hospital, etc.—The following case, in which a large plate containing artificial teeth lay impacted in the pharynx, apparently without the cognizance of the patient, during a period of five months, seems deserving of being placed upon record.

"About a year since, a gentleman, sixty years of age, and previously healthy, who had presented his son at my house for surgical advice, requested me, before leaving, to inspect his own throat, which, his friends feared, was about to become the seat of cancerous disease.

"I learned, that five months previously he had been seized, *while in bed*, with difficulty of deglutition and of breathing, a sensation as if a bit of rough cane were moving up and down in his throat—efforts to vomit, and copious flow of muco-salivary fluid from the mouth; he found that liquids and pulpy matters could be swallowed, but that the deglutition of solids had become impossible. Matters had so continued up to the period at which I was consulted. He now evinced slight hoarseness, and there was unusual fullness, with increased breadth externally, in the situation of the base of the tongue and of the pharynx. The foreign body could not, however, be defined from without. The patient further stated that the salivation, which had continued from the first, was variable in amount—sometimes nearly subsiding, and again breaking out anew. Great relief was obtained during the exacerbation, from the application of a blister to the neck.

"An experienced and careful practitioner who was called in at the time of the occurrence was informed that no cause except 'cold' could be assigned in explanation of the above-named symptoms. Being unaware that a plate of false teeth (constructed so as to supplement an interrupted range of natural ones) had been habitually worn and the patient himself not having volunteered any statement upon the subject, the greatest difficulties were thus obviously interposed in the attempt to estimate the real nature of the case.

"On inspecting the fauces, I could discover nothing more than the increased vascularity so commonly observed in the throat of an habitual smoker. Passing my finger well down to the epiglottis, I at once encountered a hard body, which, on further examination, was found to traverse the entire breadth of the pharynx, and to have become impacted there, owing to the entanglement of its sharp and projecting extremities in the opposite sides of the canal. The sharper and tooth-like end lay to the right side, and both were situated at a much higher level than the centre. A curved catheter-wire, when caused to strike the foreign body, elicited a clear ringing sound.

"I then proceeded to inspect the parts with the laryngoscopic mirror. The epiglottis was seen standing erect and red, but not swollen; the anterior portions only of the aryteno-epiglottidean folds were discernible, while the arytenoid cartilages were concealed by a dusky-red body streaked with gray. The true vocal cords were, of course, invisible.

"An attempt to move the foreign body caused efforts to vomit, spasmodic cough, and the ejection of abundant mucus, tinged with blood of an arterial tint.

"With the above phenomena before me, I inquired whether at any of the meals more immediately preceding the supervention of the symptoms just described, he was conscious of having swallowed any hard or unusual substance? To this he replied in the negative; but then, apparently for the first time, recalled the fact, that on rising on the morning following the occurrence, he had *missed his tooth-plate*, and stated, that having then imagined that it might have dropped into the urinal and been thrown out by his servant, he had dismissed the matter from his mind.

"The cause of the mischief thus stood revealed.

"Having explained to the patient the risks that might be expected to attend on the manœuvres requisite for extraction, and more particularly that of hæmorrhage (in the event of the pointed ends of the foreign substance having already caused partial ulcerative penetration of an adjacent vessel), I proceeded to operate.

"In the first place, I attempted to disengage the ends of the plate by hooking my forefinger on each alternately, exercising at the same time a moderate and cautious traction. I next tried to draw it upward, having passed a stout and well-curved catheter-wire beneath its centre. This measure, I thought, caused the body to yield slightly. I then again attacked the corner of the plate with the finger. Lastly, I passed a common polypus (nasi) forceps through a chasm in the upper alveolar ridge at a point to the left of the median line, where two incisors were wanting. Grasping the centre of the plate, I employed slow and careful traction, combined with slight rotatory movements (and aided by occasional use of the finger at its points). This final manœuvre was happily crowned with success.

"The plate proved to be of hardened gutta-percha, colored red, and felt light for its size. Its circumference was sharp, as were also its horns.

"Its extreme breadth was 2 5-16th inches. Its maximum depth at centre 13-16ths of an inch. It weighed 121·7 grains, and included five artificial teeth, and niches for five natural ones. Its concave mouth-ward aspect, placed downward, had lain on the upper part of the arytenoid cartilages, and partly on their posterior surfaces. Its palatine face had presented upward and backward, and was speckled with grayish mucus.

"The removal of the offending body was speedily followed by disappearance of the chief symptoms. Even at the date of the present communication, however (seventeen months since the accident), uneasiness is still felt at the right side of the neck at a point corresponding to the cricoid cartilage, and solid food, unless very well masticated, and in small volume, requires to be washed down by a mouthful of fluid.

"Accidents arising out of the casual displacement of a tooth-plate are not uncommon. I believe, however, that few cases are on record in which the accompanying circumstances, and more especially the forgetfulness or reticence of the patient, were more calculated to embarrass a practitioner

than in the one now submitted. Mr. Hilton* (a true 'conservative' surgeon and profound student of *Nature's* operations) has recorded a case in which he removed a tooth-plate by œsophagotomy with success. In some instances such bodies have passed into the stomach, and when not very large or not beset by sharp projections, have been discharged by stool after variable intervals. Such a result must be considered rather a rare and fortunate one. On the contrary, when detained in the œsophagus, the foreign body has been known to ulcerate its way even into the left pleura. Very voluminous bodies may reach, and even safely traverse, the stomach, but are subsequently arrested with resulting fatal mischief. In the Museum of the Royal College of Surgeons, there is deposited a preparation which exhibits a tablespoon that had been swallowed by an adult lunatic. It reached the duodenum, where it caused a perforation of the bowel."—(*Dublin Medical Press and Circular.*)

Removal of Entire Tongue without Loss of Speech—"Recent experience in the results of operations on the tongue has brought to light a fact as interesting and important as it was unforeseen. It is found that a person who has had the whole tongue removed retains all the functions that are usually assigned to that organ in a degree which is amply sufficient for all the purposes of ordinary life. He can talk with a distinctness which completely averts the suspicion of what his loss has been; he can swallow fluids readily, and, although with less ease, masticate and swallow solid food. Mr. Syme has published an account of the condition of a person in whom twelve months before he had removed the whole tongue for cancerous disease. No return of the disease had occurred, and the patient, after recovering from the operation, and while traveling in the highlands, had dined at *table d'hôtes*, and entered into conversation without betraying the deficiency under which he labored: he could swallow fluids and finely-divided food as well as ever, and could masticate solid substances, although a difficulty was sometimes experienced from their getting into awkward parts of the mouth. In ordinary speech his words were wonderfully clear and distinct, and he could sing without difficulty. The two cases which we subjoin correspond so closely in their results with that of Mr. Syme, that we think the three together may be taken as fair illustrations of the condition in which patients will be placed after suffering removal of the tongue.†

"The condition of persons who have lost their tongues assumes additional interest when we remember that it is connected with the question of miracles. It is well known that a favorite method of torturing heretics and others was to cut their tongues out. In some instances it was discovered that those who had been so treated could talk as plainly as before, and their being able to do so was ascribed to the fact that a miracle had been wrought in their favor. A very interesting notice of this subject is found in Dr. Newman's 'History of My Religious Opinions.' In a former 'Essay on Ecclesiastical Miracles' that gentleman had adduced as a fact that was strictly miraculous, that the African confessors in the Vandal persecution had their tongues cut out, and yet could speak as plainly as before. Subsequently to the publication of the essay, however, additional evidence upon the point came to the knowledge of Dr. Newman, which caused him so far to modify his opinion that he says in

* Guy's Hospital Reports.

† Omitted for want of space.—Z.

his later work,—‘ Meanwhile, I fully allow the points of evidence brought in disparagement of the miracle are, *primâ facie*, of such cogency that till they are proved to be irrelevant, Catholics are prevented from appealing to it for controversial purposes.’

“ We regret that want of space prevents our transcribing the evidence to which the author refers in full. The following are some of the most striking details: There is mentioned ‘ a girl born without a tongue, who yet talked as distinctly and easily as if she had enjoyed the full benefit of that organ ’ (Middleton). Colonel Churchill, in his ‘ Lebanon,’ speaking of the cruelties of Djezzar Pacha in extracting the tongues of some Emirs, adds: ‘ It is a curious fact, however, that the tongues grow again sufficiently for the purposes of speech.’ ‘ In answer to your inquiries about the powers of speech retained by persons who have had their tongues cut out, I can state from personal observation that several persons whom I knew in Persia who have been subjected to that punishment spoke so intelligibly as to be able to transact important business. The conviction in Persia is universal that the power of speech is destroyed by merely cutting off the tip of the tongue, and is to a useful extent restored by cutting off another portion as far back as a perpendicular section can be made of the portion that is free from attachment at the lower surface. I have never met with a person who had suffered this punishment who could not speak so as to be quite intelligible to his familiar associates.’* The belief that the power of speech is destroyed by merely cutting off the tip of the tongue is a strange one. The results of the ordinary operations in this country afford no ground for it.

“ With these points before us, we are reminded of an error into which we are likely to fall in thinking loosely about the functions of the tongue. Popularly, the tongue is considered as the chief organ of speech; it is called ‘ the unruly member,’ as if it were alone responsible for all speech and its results. In reality, however, it is known that the tongue holds a position in the mechanism of speech far subordinate to the larynx, and also below the lips. All the vowels can be pronounced without its help, so can many of the consonants.

“ Passing from these collateral considerations, however, the fact remains, as proved by results obtained in the practice of the first surgeons of the day, that the tongue may be removed and yet the patient enjoy, unimpaired to any material degree, the power of speech and of deglutition. This is a fact upon which a surgeon may well congratulate himself; for there is scarcely any condition of disease in which the patient’s existence is one of such complete and hopeless misery as that which is present in cancer of the tongue, or one from which any humane person would be more thankful to rescue, although it were only for a time, one of his fellow-creatures.”†—(*Med. Times and Gaz.*)

“ *On the Putrid Infection complicating certain Simple Fractures of the Jaw.* By JOHN CHATTO, Esq., M.R.C.S.E.—In a communication to the Paris Surgical Society, M. Richet drew attention to this subject, which he believed has been overlooked by all writers on surgery. Its

* Sir John McNeill.

† Mr. Hilton, in his lectures on “ Rest and Pain,” page 72, says: “ I do not know any tissue that repairs itself more rapidly [than the tongue]. It is abundantly supplied with capillaries filled with arterial blood and has enormous distribution of nerves, and these are the two elements that contribute most to rapid reparation.”

purport is summed up in his conclusions:—1. Fracture of the lower jaw, when the alveolar-gingival periosteum has been lacerated, and there is also a displacement of the fragments, should not be regarded as a simple but as a compound fracture, since the seat of fracture communicates with the cavity of the mouth, that is to say, both with the external air and the salivary glands. 2. Besides purulent secretion at the seat of fracture, and the various complications of neighboring abscesses, osteitis, necrosis, or delay in reunion, observed and described by authors (but which I believe to be of much more frequent occurrence than is generally admitted), there are other accidents of a general character which may become very serious and even fatal. 3. These general accidents, characterized by scarcely perceptible and irregular shivering, putridity of the breath, diarrhœa, vomiting, etc., when they terminate fatally do not leave any traces discoverable after death. 4. These general symptoms cannot be referred either to purulent infection, properly so called, or to typhoid fever. They are due to a kind of septicæmia or putrid intoxication, which I think should be termed acute to distinguish it from what was formerly called hectic fever.

“The best means of preventing this very serious complication is the maintenance of the fragments in a state of complete immovability after the reduction of the fracture; and this may be best done by means of ligatures applied to the teeth. Even when the symptoms are very far advanced they may be arrested by this means, as proved by a case related in the paper. M. Dolbeau also informed its author that he had seen very formidable symptoms of putrid infection disappear in two cases after incisions had been made in a dependent position. At a subsequent meeting of the society, M. Chassaignac pointed out that he had in his work on suppuration fully described this serious complication of fracture of the jaw, and its treatment by means of drainage tubes. Nevertheless, it is certain that the occurrence is far from being generally recognized; fractures of the lower jaw being usually regarded as of little consequence, and certain to do well. Yet, of 27 cases, collected by Malgaigne from the registers of the Hôtel Dieu, 4 proved fatal: and of 10 cases observed by M. Richet, 2 were followed by death by reason of this putrid intoxication.”—(*Gazette des Hôpitaux*, and *Brit. & For. Med.-Chir. Rev.*)

“*Villate's Fluid in Caries and Fistula.* (*L'Union Médicale.*)—In March, 1863, Dr. Notta published a memoir on the treatment of caries and fistulæ consecutive to cold and tuberculous abscesses, gunshot wounds, disease of the frontal sinus, by the famous veterinary remedy, Villate's Fluid. Subsequent experience has confirmed his views of its efficacy in these affections. It has, he states, been largely used by Mr. Nelaton, and with the same happy results. It should be used only in chronic cases, for where any acuteness exists, instead of a salutary, modifying inflammation, it is very apt to cause phlegmonous phenomena with serious consequences. It should be injected, every second, third, fourth or fifth day, into the fistulous tract, according to the effects produced, and sometimes for three or five days continuously, and then be discontinued, when inflammatory symptoms are developed, to be resumed subsequently. But in rebellious cases it should be used daily. It is sometimes advisable, where the caries is superficial, and where the wound is accessible and filled with fungosities, to use a piece of lint moistened with the fluid. The applica-

tion causes severe pain, which lasts from one to twenty-four hours.* Dr. Notta gives eighteen cases in which it was used. Its composition is: Aq. plumbi subacetatis, f℥; Cupri sulphatis crystal, Zinci sulphatis cryst., āā, ℥ss; Aceti, f℥vj.”—(*New York Medical Journ.*)

“*New Solvents for Gold.*—M. NICKLÉS has discovered that gold dissolves in the ethereal perchlorides and perbromides which he described last year (see *Chem. News*, vol. xi. p. 254). As the gold dissolves in the manganic compounds, the green color of these gradually disappears (proto compounds which are insoluble on ether being deposited), and a yellow or red solution of gold is left. The ether being evaporated from this solution and the residue sufficiently heated, a coating of metallic gold is left about the bottom of the tube, which suggests a process for gilding glass. The gold is reduced from the ethereal solution by protosulphate of iron and also by protochloride of tin, but *purple of Cassius* is not produced in the latter case. Many sesquichlorides and sesquibromides, the author states, also dissolve gold, those which are easily reduced answering best. The cause of the solution is obviously the instability of the per- and sesquichlorides and bromides, for which free chlorine and bromine are easily separated. The ethereal periodides also dissolve gold, forming an iodide of the metal, showing that *nascent iodine* is a solvent, although that metalloid in the ordinary state is without action on gold. Lastly, an ethereal solution of hydriodic acid will dissolve gold-leaf, owing, of course, to the instability of the acid and the liberation of free iodine in the nascent state.”—(*Chem. News.*)

“*Purification of Platinum.* By MR. E. SONSTADT.—The tendency of platinum to alloy with other metals at a temperature far below its fusing point is sufficiently well known to every user of platinum crucibles. It is equally well known that iron, etc. which has been absorbed by platinum, cannot be removed, except superficially, by the action of hydrochloric acid for instance, nor even by heating in acid sulphate of potassium. Stas, in his memoir on the atomic weight of silver, etc., states that he purified his platinum vessels from iron by causing them to come in contact, at a red heat, with the vapor of chloride of ammonium. The process had to be repeated as often as any yellow sublimate was formed. This process is less effectual, or less conveniently and speedily effectual, than the modification of it that I have to propose; because, if the vapor of the sal ammoniac is generated from the solid salt in the vessel to be purified, the heat absorbed in the vaporization of the salt tends to keep the vessel at a temperature below that at which volatile metallic chlorides are most readily formed. Instead of chloride of ammonium, I put dry double chloride of ammonium and magnesium in the platinum vessel intended for purification. The vessel is then heated to about the fusing point of cast-iron for about an hour. I find a Gore's furnace convenient for this purpose. In this process, not only is chloride of ammonium vapor given off for a long while with the double salt, at a temperature much above that at which chloride of ammonium alone volatilizes, but when that salt is completely expelled, the chloride of magnesium remaining is perpetually being decomposed with evolution of free chlorine, and, frequently, the formation

* This might probably be obviated by the addition of morphia or some other anodyne.—Z.

of a crystalline crust of periclase lining the crucible. Platinum thus purified is softer and whiter than ordinary commercial platinum. The method is not available solely for the removal of iron, but retrieves crucibles that have become dark colored and brittle from exposure to gas-flame, as well as crucibles that have been attacked by silicates during fusion of these with carbonate of sodium. I cannot conclude this note without remarking on the extreme facility with which platinum becomes impure by heating in contact with matters containing only a very small proportion of substance capable of attacking the metal. Thus, a platinum crucible becomes sensibly impure after prolonged ignition at a high temperature, bedded in commercial magnesia. On the other hand, I have kept a platinum crucible at a constant weight to the tenth of a milligramme over a series of intense ignitions, when the precaution has been taken to bed it in chemically pure magnesia.”—(*Chem. News.*)

Silicon.—“Silicon has the property of combining with various elementary bodies, especially metallic elements. We have here some specimens illustrating this fact. For instance, silicon combines with copper, forming a substance very similar to the well-known bronze, which is a valuable metallic compound consisting of copper and tin. Here is a specimen consisting essentially of copper and silicon. It contains about 2 per cent. of silicon. It was made by heating copper at a very high temperature in contact with silica and carbon. If you were to take copper, or even a metal which has a more powerful affinity for silicon than copper has, and heat it in contact with silica at the highest temperature of our furnaces, or even at higher temperatures than we can attain in our furnaces, you could not effect any combination between the silicon and the metal. Of this fact we have a very capital illustration here—a small one, it is true—in connection with the metal platinum. Platinum is an exceedingly infusible body, though by means of certain gas arrangements we can melt it without difficulty. If we heat it to a very high temperature indeed, in contact with silica, it undergoes no change whatever; but if we add to the mixture a third body, which has a powerful affinity for oxygen at a high temperature, then, under the influence of this third body, the silica is reduced, and the silicon, thus set free, combines with the platinum. A convenient body to effect this reduction is carbon—common charcoal, for example. In this tube is a specimen of platinum which was melted at a comparatively low temperature, simply by heating it in contact with silica and carbon, the carbon serving only the purpose of laying hold of the oxygen, and tending to set free the silicon. We have here a twofold affinity in play—that of the oxygen for the carbon, and that of the silicon for the metal; and we obtain thus, by exposing platinum to this mixture at a comparatively low temperature, a well-fused globule of platinum containing silicon.”—(Dr. PERCY, *Chem. News.*)

To clean Silver.—In one of his lectures before the London Soc. of Arts, Dr. F. GRACE CALVERT gives (*Drug. Circ.*) the following “simple method of cleaning silver or silver-plate, without the trouble of employing rouge or other cleaning powder, which, besides rapidly wearing off the metal, takes up much time. It consists in plunging for half an hour the silver article into a solution made of 1 gallon of water, 1 lb. hyposulphite of soda, 8 oz. muriate of ammonia, 4 oz. liquid ammonia, and 4 oz. cyanide of potassium; but, as the latter substance is poisonous, it can be

dispensed with if necessary. The plate being taken out of the solution, is washed, and rubbed with a wash leather."

"*Thallium Glass*.—M. LAMY finds that thallium is preferable to lead to replace potash. It communicates a yellow color to glass, just as sodium gives a green coloration. Thallium glass, it is said, is denser and more refractive than potash glass, and the author believes such glass will be specially applicable for some certain optical purposes, and also for the manufacture of some artificial jewels. The best specimen was obtained with the following proportions:

Sand	300
Minium.....	200
Pure carbonate of thallium.....	335

The mixture fused easily, and formed a perfect homogeneous mass, which had an agreeable and brilliant yellow tint. The density was 4.235, and the refraction index for the yellow ray was 1.71."—(*Sci. Amer.*)

BIBLIOGRAPHICAL.

Journal of Applied Chemistry; A Monthly Publication of 16 pages quarto, devoted to Chemistry as applied to the Arts, Manufactures, Metallurgy, and Agriculture. Edited by PROF. H. DUSSAUCE, Chemist, assisted by the Staff of Editors and Reporters of Dexter & Co., in New York, Boston, Philadelphia, Cincinnati, and other cities, with paid Contributions from Professors of Chemistry in various Educational Institutions, and from other competent writers. Two dollars per annum, or one dollar and fifty cents strictly in advance.

Technical Chemistry is of so much practical interest to all classes of the community, that it is surprising greater effort has not been made to promote its more rapid development by means of periodical literature, the value of which is so fully appreciated in the advancement of other branches of knowledge, as to induce those of comparatively limited application to have special organs for the collection and dissemination of information relating thereto, while this, with such intimate correlations throughout the whole range of industrial pursuits, has been greatly neglected. The publication of a journal dedicated to this specialty is, therefore, of general interest, as it will not only stimulate one but many branches of business, and directly encourage a more scientific and systematic cultivation of the arts, by diffusing a more correct knowledge of both theory and practice, true art being in reality but applied science. The journal before us is gotten up in good style, contains much practical information on chemical technology, and is worthy of liberal encouragement, more especially as the subscription price is so small as to place it within the reach of every one interested in the subject.

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THE
DENTAL COSMOS.
NEW SERIES.

VOL. VII.

PHILADELPHIA, JULY, 1866.

No. 12.

ORIGINAL COMMUNICATIONS.

NUTRITION.

BY J. H. M'QUILLEN, D.D.S.,

PROFESSOR OF ANATOMY, PHYSIOLOGY, AND HYGIENE, IN THE PHILADELPHIA DENTAL COLLEGE.

IN decomposition or the continual waste which takes place in the tissues and makes the supply of nutritive materials necessary, the drain is due to the continual destruction of individual cells that have lived their appointed time. This destruction of the cells constitutes molecular death, in contradistinction to somatic death or death of the whole body. In the cells *every* tissue of the body has within itself the elements of renovation and of destruction. Such being the case, the necessity of an acrid substance or a carneous or spongy body to effect the disintegration and removal *even* of hard substances, such as the osseous and dental tissues, is not demanded, as it can be readily effected by molecular disintegration. The component cells of bone, dentine, and cementum, having lived their appointed time, degenerate, and their calcareous contents becoming soluble by uniting with fluids, are readily taken up by the venous or lymphatic radicals; neither of which can be looked upon as capable of breaking down any tissue; for the vessels distributed to a part, be they arteries, veins, or lymphatics, are but the conduits or carriers of nutrient fluids to and waste materials from the tissues.

Undergoing thus, as every portion of the body does, the hardest as well as the softest, constant disintegration and reparation, it will be found, if examined at separate periods of existence, to be composed of entirely different materials; in other words, the old will have given place to the new. Man and animals generally may be compared to the ship of the Argonauts, which, after a long voyage, passing from place to place, and undergoing constant repairs, on returning to its native port was found to be made up of entirely different materials from that with which it started. Various opinions have been expressed, with regard to

the period it takes for the complete renovation of the body. There is a popular idea that every seven years we are remade; it is difficult, however, to assign any definite period on account of the varying activity of waste and repair in the different tissues and at different periods of life; as they are influenced by age, sex, climate, physical and intellectual operations; being much more rapid in the young than in the old, and in the active than in the indolent.

It is generally supposed that the waste of tissue consequent upon the active operations of mind and body during the day, is repaired only in the period of sleep; in other words, that it is all waste and no repair in the waking hours, and all repair and no waste during somnolence. This general belief, however, is unwarranted by the facts, for although it may be truly said that "sleep is tired nature's sweet restorer," and that the fatigues of the day are vanquished during repose, repair is everywhere, and always making up for waste, the two processes however vary in their relative rates. During the day, when body and mind are actively employed, waste is in excess of repair; still repair does take place even then: in sleep, repair is in excess of waste, for waste even then progresses. The constant movements, even during sleep, attendant upon respiration and circulation, the never-ceasing rhythmical action of the lungs and heart, and the coursing of the blood through the vessels, must of necessity be attended with incessant waste as well as repair. While, therefore, the facts are against the supposition that sleep is the only period during which renovation takes place, there can be no question, that in healthy organisms (accustomed to the discharge of the daily recurring round of duties) when activity is most reduced, repair is most rapid.

Nutrition, or assimilation therefore is a continuous molecular process. Molecule by molecule the tissues are destroyed, molecule by molecule they are repaired, new material is incessantly formed, and old material is as incessantly, but with varying intensity, disintegrated; and this is true of all tissues, nervous, muscular, osseous, and dental. Particle by particle they are formed, act, die, and are replaced. This incessant tearing down and building up of the organism makes it necessary, not only that there shall be periods of repose, but that materials from without shall be constantly introduced to supply the waste which occurs in the discharge of the various functions. The food which is taken at stated periods and duly digested, absorbed and assimilated, furnishes the necessary pabulum for the purpose. Mental or physical exertions, however, may be prolonged so far, and the consequent waste become so great, due to inadequate periods of rest and supply of material, or to the latter being unassimilated, that overtaxed brains and other organs eventually succumb to such an extent, that they never recover their former integrity and power, even under prolonged relaxation and the most judicious hygienic treatment.

In the operations referred to, there is not only a consumption of matter, but also of *force* that must be replaced, for "whatever amount of power an organism expends in any shape is the correlate and equivalent of a power that was taken into it from without." In other words, *force*, like *matter*, in place of being created *in* and *by* the organism, is obtained outside of it. As has been remarked on a former occasion, heat, light, electricity, magnetism, and vital force are but modifications of one form of force, which, coming to our planet from the sun in the shape of light, assumes between its entrance and departure a multiplicity of forms. The exhaustion of vital force therefore dependent upon physical or mental exertion, is made up by an equivalent of force obtained from without, and this is derived from the air that is respired, the food that is digested, and the light by which each organism is surrounded. Views such as these, it is true, have been objected to on the ground of materialism; but having responded on a former occasion to such fallacious and ungrounded assumptions, I do not deem it necessary to say anything further on that point, but would offer the following extract from a letter received a few months back from JEFFREYS WYMAN, PROFESSOR OF COMPARATIVE ANATOMY IN HARVARD UNIVERSITY, CAMBRIDGE, MASS, viz.:

"I have read, with interest, the discussion on the 'correlation of forces.' One is at a loss to understand how the wide generalization in the doctrine referred to makes Nature God, or narrows God down to Nature. The only impression the doctrine gives me is, that it opens a wider and grander view of His power and majesty, and that He was never more the *great first cause* than now. Those who hold the opposite seem to entertain the belief that unless the Deity is made to conform to their conceptions of the manner in which the universe is carried on, then the Deity is made nought. Are not they the irreverent ones?"

In addition to this, I present the accompanying extract from an admirable work,* received from PROFESSOR HOLMES, since my return from a recent visit to Boston, wherein he states, in an essay on the "MECHANISM OF THE VITAL ACTIONS," that "MR. NEWPORT, the very distinguished physiological anatomist, communicated a paper to the LINNÆAN SOCIETY, in the year 1845, on the 'Natural History of the Oil Beetle, *Meloë*,' which contained the following sentence: 'The facts I have now detailed lead me, in conformity with the discovery, by FARADAY, of the analogy of light with heat, magnetism and electricity, to regard light as the primary source of all vital and instinctive power, the degrees and variations of which may, perhaps, be referred to modifications of this influence on the special organization of each animal body.' The council of the society objected to the publication of the passage from which this is ex-

* "CURRENTS AND COUNTER-CURRENTS." By OLIVER WENDELL HOLMES, Parkman Professor of Anatomy and Physiology in Harvard University.

tracted. The Society's Index Expurgatorius would have been more complete, if it had included the Invocation of the third book of 'Paradise Lost,' which has hitherto escaped the Anglican censorship."

"But if the student of nature and the student of divinity can once agree that all the forces of the universe, as well as all its power are immediately dependent upon its Creator, that he is not only *Omnipotent* but *Omnimotent*—we have no longer any fear of *Nebulæ* theories or doctrines of equivocal generation or of progressive development." * *

"We are ready therefore to examine the mystery of life with the same freedom that we should carry into the examination of any other problem; for it is only a question of what mechanism is employed in its evolution and sustenance."

The wish expressed above seems likely to be realized, for on all sides the desire is manifest to examine into the truths of nature rather than to submit to the dogmatism of the past, dependent upon man's fallacious interpretations. Mr. Newport enjoyed the privilege of seeing his views, which were treated in such a cavalier manner, when first promulgated, adopted not only by the wisest, but the best of men.

(To be continued.)

KEEPING CAVITIES DRY.

BY C. D. ALLEN, NEW YORK.

Read before the Society of Dental Surgeons of the City of New York.

THE degree of success achieved in the operation of filling teeth is dependent to a greater or less extent upon the combination of a number of circumstances, favorable or adverse.

How much the dentist has to contend with in the practice of his profession, none but those who have essayed to climb the ladder of excellence can form an adequate conception. How often his patience is tried, to what degree of tension his nervous system is wrought up, and how many deep-felt imprecations are smothered, ere they be ushered into audible existence, none but he whom experience has guided along the rugged path can ever know.

The difficulties to be contended with are numerous. Take, for example, that indescribable feeling of attraction or repulsion, if I may use the terms, which is sometimes so very perceptible between patient and operator.

For the purpose of making myself better understood, let me ask who is there among you that has not, at some time, experienced certain feelings somewhat like the following?

A patient is seated in the chair, for whom you begin to operate. But a few minutes only are necessary to make you painfully aware that there

is a total want of harmonious feeling existing between you. If you place the head in a certain position to facilitate your manipulations, it is very soon as nearly opposite to that as possible.

Every motion you make seems to be contested. Not only must you contend against the voluntary opposition of the patient when such is manifested, but every conceivable adverse circumstance which can possibly arise during the operation seems to conspire to augment your discomfort. Perhaps you cannot lay your hand on just the instrument you most desire, or your gold will not pack well, or your filling when half done manifests a tendency to roll, when you must take it out and begin anew, or you cannot control the flow of saliva. Some, or all of these, and perhaps more, conspire as it were to defeat your every effort.

The sitting, however, is finally brought to a close, your patient departs, and you experience an indescribable feeling of relief; for every single thing has gone wrong from the very commencement, and the whole operation, from beginning to end, was very much like walking up hill on a slippery road.

You immediately usher in another patient, and from the moment of the first cut of your excavator a degree of confidence is felt which was totally wanting in the former case. Now everything goes on smoothly, although the cavity, *per se*, may be even worse than the other. There is now no misplacement of the head after its proper adjustment. No trespassing saliva to interfere with your manipulations. The gold packs most beautifully, and piece after piece remains just where you want it. Like an elegant jewel, the filling, when completed, is all you could desire; and there it stands a monument to your professional ability.

To what can this difference be attributed? Perhaps our friend Dr. Atkinson would say that, in the first instance, the *Swamp Angels* were on a rampage.

The French might describe the operator and patient, in the last case, as being *en rapport*; while Dr. Franklin may possibly ascribe it to the absence or presence of compatibility. But be the explanation what it may, the fact that this difference *does* exist, and that the same degree of congeniality between the operator and his various patients is not always present, and, moreover, that the result of the operation is to a greater or less extent influenced by this, none I think will deny.

There are numerous other difficulties which the dentist in his daily practice is obliged to surmount; but I will not now afflict you with a recapitulation of those which *possibly* have fallen to your lot even to-day. The recollection of them is doubtless still too fresh in your memory to require it. Without alluding therefore to others, I will speak at once of that most common and persistent foe of the dentist—Saliva.

The various forms and modifications under which it presents itself in different cases, have each their individual peculiarities. Who would not

rather operate in the mouth where this secretion is deficient, to one in which it is abundant? And if permitted to choose between aqueous and viscid, where abundance was equal, the former would certainly receive the honor of the choice.

Saliva is not so much to be dreaded as viscid mucus* for two or three reasons. In the first place, it is more easily controlled by the various methods employed for the purpose, the napkins and other absorbents taking it up more readily. Besides, if despite all your precautions, a little moisture *does* find its way to the filling, it can, if aqueous, be readily absorbed, and the operation proceeded with; while if of a very viscid character, it is a waste of time to attempt to proceed with the expectation of producing a good result.

Of the various means which have been resorted to by the profession for the purpose of overcoming this great difficulty, none perhaps has been so universally adopted as the napkin. This, in conjunction with bibulous paper, may in a great majority of cases be used with perfect success; still, instances are continually occurring where we find it advantageous to resort to something else, or *wish* that we had something *better*.

As the discussion of the subject this evening will necessarily be of a character more practical than theoretical, and in all probability made up chiefly of the personal experience of those who may feel disposed to favor us, I will in a few words narrate my own.

1st. As to the means of retaining the napkin in its proper place while filling inferior teeth: I employ for this purpose a holder made of silver wire, which is held by the patient. Appliances of a similar character are for sale at the depots. I attempted to use a duct compressor, designed by Dr. Hawes, when it was first introduced, but without a satisfactory result at that time, and have not used it since. Should think, however, that in its present improved form, with ratchet and spring, it would work better than formerly with a set screw.

Of the "coffer-dam" described by Dr. Mills some time ago, I can say nothing, having never attempted to employ it.

I have used, and still continue to bring into occasional requisition, "Barnum's Rubber Dam," which, for certain cases where the cavity to be filled is in an incisor, or even sometimes in a bicuspid, may be very advantageously employed. But I, for one, have never been able to apply it successfully upon the molars. This *may* arise from my mismanagement. If we hear this evening that others have been more successful than myself, of course no other inference can be deduced. But, in whatsoever locality this appliance is used, it is necessary, first, to remove all tartar and mucous deposit from the teeth to which it is to be applied; otherwise the rubber will not bind on the tooth, but have a tendency to slip off, much to the annoyance of the operator.

Another means which is frequently employed to great advantage, to

relieve the mouth from an accumulation of the secretions, is the *saliva pump*, consisting of a glass syringe-like tube and bulb, with a rubber ball to be held in the hand. As, however, most if not all present are familiar with the instrument and its manner of use, it will hardly be necessary to consume time in describing it. In making a selection, however, let me observe, care should be taken to choose one with a *large opening in the nozzle*, for the reason that, although a smaller one might work very well in cases where the saliva was thin and watery, yet with thick ropy saliva, it would be found wholly inefficient.

For drying cavities, I make use of prepared cotton or flax, punk, and bibulous paper. The latter unquestionably standing pre-eminent in its absorbing properties, and thereby enabling us to attain a greater degree of dryness preparatory to filling, than with the other substances.

This subject of combating with the outpourings of nature, in the oral cavity, is one which has attracted much attention among dentists. And yet, when we consider the age in which we live, the wonderful and almost incredible inventions and improvements which are constantly being made in every department of science, and then reflect on the comparatively little advance which has been made in this regard, is it not well calculated to induce a feeling of humility in a profession which has, and does lay claim to so much inventive genius?

That there is great room for improvement in this direction, all will admit. And some one more enterprising or fortunate than the rest will, by his improvements or discoveries, be the means, some day, of benefiting not only the whole dental profession, but through its members a large portion of the human family. Let us hope that the day for this is not far distant, and that the combined efforts of so many working in the same direction may, ere long, result in the production of a more perfect system than now exists for

“KEEPING CAVITIES DRY.”

THE TUMORS OF THE MOUTH.

BY JAS. E. GARRETSON, M.D.

(Continued from page 572.)

Osteo-Carcinoma.—In my last three papers I referred to various tumors differing as species are concerned, agreeing as to a general classification, and which I tried accurately to describe, giving to them, as a common name, osteo-sarcoma, and which great class of tumors I succeeded, I trust, in relieving of some obscurity.

The class we are now to consider—the heteroclite—is one which has been equally divided and subdivided, specified and synonymed with the preceding, so much so, indeed, as to elicit from most authors a confession

as to the confusion which seems to render any simple and exact description almost impossible.

Much thought on the subject, and not a little experience, has suggested to my mind that there is, in reality, but a single cancerous affection of the jaws, or perhaps I will be better able to make myself understood if I say two; all peculiarities, modifications, and associations are but pathological features developed by age or circumstances in the one or the other of these general classes, so that if I am right in this tenure, when I describe one, or at best two conditions, with their associations, I shall, for all practical purposes, have told all that need necessarily be known for the general guidance of the surgeon. I think so, at least.

Carcinoma is a word gotten from the Greek *καρκινος*, signifying a crab. According to the classification of Fische, which it suits our purpose to adopt, it applies to a family of diseases which embraces the different forms of cancer.

Osteo-carcinoma is a term, then, which I will adopt to apply to any truly cancerous tumor of the maxillary bones; it embraces the two species which I have said are the only malignant growths found associated with these bones. These species are the types medullaris and scirrhus.

Scirrhus of the maxillæ is an infrequent condition—a quite rare disease. Medullary matter is the pathological feature which characterizes the mass of the carcinomatous tumors of these parts; so constant, indeed, is its presence, that it would scarcely be amiss to say that medullary disease is the only cancer of the jaws.

I suppose I have, in the course of my observations, met with two decided cases of scirrhus of the maxillary bones, both being associated with the superior jaw; certainly I have not seen more than these two cases. It appears first as a hard mass, a little lump perhaps, associated with the integuments, movable for a time, but soon becoming fixed, and implicating all the immediately surrounding parts, "casting out its claws," as the people have it. If, after amputation, a scirrhus mass is bisected, it is found to resemble in its stroma the substance of a turnip.

The hardness of scirrhus, says Mr. Paget, when compared with that of most other tumors, is extreme; it is about equal to that of fibro-cartilage, and is associated with a corresponding rigidity, weight, and inelasticity. A characteristic appearance is a slight concavity assumed by these tumors on section, and which, as remarked by Mr. Paget, belong to no other tumors. It differs again on section from the sarcomatous tumors in having no distinct grain or fibrous plan of structure.

In microscopic structure it varies still more markedly, its cells being not constant but heteroclitic. Scirrhus, like medullary cancer, tends, but much more slowly, from the occult to the open stage.

With these few remarks on scirrhus, which will serve at least to exhibit that I am not unaware that such form of cancer does occasionally exist

in the jaws, we will pass to the medullary form, and which I will now assume is the carcinoma proper and peculiar of the parts.

Miller has, however, several sections on malignant scirrhus of the maxillary bones, and which he considers under the heads osteo-cephaloma, osteo-carcinoma, osteo-melanos, and osteo-cancer. Against these subdivisions I shall not take the liberty to object, leaving it for the reader to judge whether or not they are but one and the same disease with modifications.

Our subject can, I think, be divested of much obscurity, if at this point we stop for a single moment to consider the meaning of certain terms which long usage have so associated with cancerous conditions that they must, I am sure, long years ago, have gotten far beyond the meaning originally intended for them. Take for example the term fungus hæmatodes. It is a term used freely and loosely by surgical writers, and is generally accepted to mean most malignant cancer. Let us analyze this term: we find it made out of the Greek *αἷμα*, signifying blood, and *εἶδος*, meaning appearance—of bloody appearance. Any and all granulations being of bloody appearance, are therefore fungus hæmatodes. If, however, it was meant to be applied strictly to pathological features, we might employ it learnedly to express the common proud-flesh of an adynamic ulcer.

Writers use the term as a synonym of medullary cancer, but when they describe fungus hæmatodes, they get a condition and not a principal. They might, with the same propriety, use the word suppuration as a synonym of inflammation. Fungus hæmatodes is a phenomenon, as suppuration is a phenomenon, as pain is a phenomenon attending on cause. Such looseness in describing disease cannot but confuse the student and render our nomenclature unreliable as a source for finding expressive terms; terms that shall be patent to the scholar everywhere, and under all circumstances. Thus Mr. Hey, who was the originator and maker of the term fungus hæmatodes, employed it as the representative of the open state of medullary cancer: it certainly well expresses the phenomenon, but has no more special meaning.

Alibert calls all the hæmatocies by this same name, and as they are all of bloody appearance, certainly he is justified in so expressing himself.

Dupuytren employs the term in describing the erectile tumors, while Graefe presses it into service in describing the "Telangiectasiæ." Thus, as a first example, we see that there is no peculiar disease of the jaw which can be called fungus hæmatodes. We do not, however, eschew the term; we cannot do without it, as it represents a feature.

Let us take a second term. I instanced Miller's fourth classification of cancer of the maxillary bones, the osteo-melanos. Now the term melanos refers to a pigment, and signifies simply black or colored structure. I will not myself say that Miller errs in this classification, but

will simply note down what Mr. Paget says concerning the colored cancers.

"The melanotic, or melanoid cancers are (says Mr. Paget), according to my experience, with very rare exceptions, medullary cancers modified by the formation of black pigment in their elemental structures. On this long disputed point there can, I think, be no reasonable doubt. I have," he says, "referred to a case of melanotic epithelial (see his Lectures, page 582), but with this exception, I have not seen or read of any example of melanosis or melanotic tumor in the human being which might not be regarded as medullary cancer with deposit of black pigment."

These remarks and experiences of Mr. Paget exhibit quite satisfactorily, I think, the fact that this classification is an unnecessary, not to say an unscientific one. The deposit of pigment is not the disease, but merely an accidental feature appearing in the course.

May I not, then, be permitted to suggest that the term, in the special sense in which it is employed by Mr. Miller, may be dropped without detriment to nomenclature?

The osteo-cephaloma of Miller is medullary cancer.

Osteo-carcinoma; I have given the derivation of this term, and exhibited its character as a noun of multitude.

Miller, in his classification, thus writes: "Osteo-carcinoma is comparatively rare; when it does occur it is usually as a secondary symptom of malignant cachexy, the primary indication of which has been the formation of carcinoma in the soft parts."

If, in this classification, Miller is compared with other authors, his meaning will be difficult to make out. I am sure, that for my part, I do not know what kind of cancer he alludes to. If he had not so specially classified the disease, I would suppose he meant the same as Fische; but then carcinoma, as Fische employs the term, and as we here follow him, is not a very rare condition; on the contrary, it is unfortunately a quite common disease. I would ask, then, considering the character of the term carcinoma as a noun of multitude, if this classification of Miller might not also be dispensed with?

Osteo-Cancer.—This is another classification; it is used as a sign of the malignant ulceration of bone. The only objection I have to urge against this term is, that it makes another unnecessary class. We would scarcely suppose it possible that an ulceration could occur as the primary lesion. If, then, it is a secondary condition, it is only an attendant phenomenon, and can have no claim to the distinction of special classification—the disease, or rather the condition, would be carcinoma in a state of ulceration, and it seems to me if we should describe it as ulcerating osteo-carcinoma, we would give it all proper signification, while, at the same time, we should make still one less of these special confusions.

Synonyms.—To these, when learnedly made, no objections may, perhaps, be urged. So many names for one thing is, without doubt, confusing enough to the student; but then, this is a matter which time and study make familiar to him, and more than this, reasonable and proper.

I would have my reader then infer, that if in the study of the malignant disease of the jaws, he will agree with me to throw entirely aside the unjust nomenclature which so surrounds the subject, and with me approach the study on general principles alone, that he may, from a single stand-point, at one glance take in the whole of the subject.

And first, to return to what I have alluded to as the persistent type—medullary matter. This form of carcinoma is named from its resemblance to brain substance. Its synonyms are many, generally good, but a little confusing when associated with degenerating sarcoma; but on this point I hope my reader is sufficiently fortified.

I have remarked that one classification made by Miller, of the cancerous tumors of the jaws, is osteo-cephaloma: this, I said, was a synonym to medullary; meaning the same thing. I have said, too, that with an exception mentioned, the medullary type is the only form of cancer of the maxillary bones. Now in Mr. Miller's book is a comparison which he has drawn between osteo-sarcoma and osteo-cephaloma; the comparison embraces ten conditions. If the reader will closely study them he will truly have his subject in a nut-shell.

1. Says Mr. Miller, osteo-sarcoma is seldom found prior to adult age; osteo-cephaloma may occur at any period, and is as frequent in the adolescent as in the adult.

2. Osteo-sarcoma is usually attributable in its origin to external injury. Osteo-cephaloma is most frequently of spontaneous origin.

3. Osteo-sarcoma is slow and gradual, and more or less uniform in its growth. Osteo-cephaloma is much more rapid, and tends to enlarge unequally, growing chiefly at those points where there is least mechanical resistance.

4. Osteo-sarcoma is usually almost, and sometimes altogether painless, unless when some nervous trunk or plexus is compressed. Osteo-cephaloma, from the first, is attended with severe lancinating pains.

5. Osteo-sarcoma is firm, and yields but little to touch, even undue pressure is scarcely painful; an obscure crepitus is often felt. Osteo-cephaloma is soft and elastic from an early period; the shell of bone and all other original texture soon becoming merged in the medullary formation. It is elastic, and affords no crepitus when an original tumor, and pain is aggravated by compression.

6. Osteo-sarcoma entails but little disorder of the general health. Osteo-cephaloma is attended by marked cachexy, even from the beginning.

7. A casual abrasion of the skin, or mucous membrane investing an osteo-sarcoma, shows a simple character, and may be brought to heal under ordinary treatment. A similar breach in the surface of an osteo-cephaloma does not heal, but widens more and more and becomes the site of fungous protrusions.

8. Osteo-sarcoma does not invade the neighboring tissues, but pushes them aside by its expansion, and abides within the bone in which it was developed. In the upper jaw, for example, it remains limited to the expanded confines of the antrum, and at those points where the bony and even membranous parietes are deficient, there is no ulceration followed by fungous protrusions, but only a moderate increase of growth in a lobulated form, with or without a rawness of the surface. Osteo-cephaloma, on the other hand, pushes no texture much aside, but early involves all; the antrum is soon passed beyond, and the base of the cranium is affected even before much show has been made externally. Whenever deficiency of the investing texture occurs, ulceration and fungous growths are sure to follow.

9. Osteo-sarcoma long continues in the occult condition. Breach of the surface when it does occur, does not extend rapidly, and evinces no tendency to malignancy of character. The discharge is purulent or puriform, not profuse. There is no tendency to hæmorrhage unless by accidental injury, and then it is slight, and easily controlled by pressure. Osteo-cephaloma soon passes from the occult to the open stage. The ulcer spreads and is obviously the seat of malignancy. Discharge is profuse, fetid, and bloody. Hæmorrhage is not unlikely, of spontaneous origin, and little amenable to control.

10. Osteo-sarcoma does not spread, either by contiguity in the tissue, or remotely by the lymphatics. Osteo-cephaloma does both; at an early period the lymphatics are manifestly and hopelessly involved.

These comparisons, by Mr. Miller, are very happy. The reader must not forget, however, the tendency of sarcoma to pass into carcinoma, and there is very frequently a period in the history of the former in which it is almost impossible to say whether the simple or malignant structure predominates. The comparisons refer to marked conditions in the two diseases—that is, true and unmixed osteo-sarcoma and decided osteo-carcinoma or cephaloma.

Practically, says Mr. Miller, it is of the utmost importance that we should be able to distinguish between the two diseases; each is of not unfrequent occurrence, and each requires distinct rules of treatment.

CONSERVATIVE DENTISTRY.

BY A. LAWRENCE, M.D., D.D.S., LOWELL, MASS.

Read before the Merrimack Valley Dental Association, May 3d, 1866.

GENTLEMEN:—Learning last evening, much to my regret, that the essayist for this meeting cannot be with us, I have hastily arranged a few thoughts upon Conservative Dentistry, the subject assigned for discussion at this time. In taking this step I do not expect to supply the loss you sustain in the absence of Dr. Willard, nor to arrogate the functions of the teacher, but merely to suggest a few points for discussion and arraignment at the bar of professional judgment, from which decision some general good may result.

To my apprehension, the subject is a very broad one, embracing the causes, immediate and remote, which result in defective or decayed teeth, and also the proper prophylactic, or the curative treatment with which to combat the causes, or repair the injury.

Why do the teeth decay? is not a novel interrogation. We have all heard it; but how often is it correctly and to anybody satisfactorily answered! I am aware that theories vie for the championship in this matter, each running well but generally in opposite directions, making it quite out of the question for ordinary perception to determine conclusively which, if either, is entitled to the prize. Auzebè, Bourdet, Fouchard, Jourdain, and other French writers of the eighteenth century, although not very lucid, entertained a belief in direct agencies, such for example as mechanical injuries, vitiated saliva, the lodgment of particles of food between the teeth, acids and sudden transitions of temperature, etc., which view is in accordance with Salmon, in his *Compendium of Surgery*, published in London, 1644.

Fox and Bell considered caries of the teeth identical with that of other bones; but this theory, I believe, is now generally rejected.

Hippocrates, even, had his theory for dental caries, ascribing the evil to cold—“*Frigidum inimicum ossibus, dentibus, nervis, crebro*,” etc.; but at a considerably later day the exactly opposite doctrine was advanced by M. Ribè, who says, “Man is the only animal accustomed to hot food, and is almost the only animal affected with carious teeth.”

Some writer, whose name I do not now recollect, asserts, in substance, that the North American Indians were free from debilitated stomachs and decayed teeth until the introduction of tea among them. If this view of the case is the correct one, the Celestials should have the worst teeth of any people in the world, and “Boston tea-parties” become so fashionable as to command the respect and co-operation of every well-wisher to his race.

But a few years since it was asserted that saleratus is the bane of life,

and the destroying angel so far as the teeth are concerned, which doctrine was promulgated far and wide through the scientific, dental, and other publications of the day, and was received by many with a faith which no denial or argument could shake, for the reason that it appeared in print, and had besides the merit of boldness of assumption. Time passed on, and saleratus maintains its place in culinary chemistry, while the whole subject, in its application to dental caries, has passed into forgetfulness.

Now, gentlemen, I have, in a fragmentary manner and without regard to chronological order, alluded to a few of the many theories regarding the cause of dental caries, which have appeared from time to time, and to a certain degree have received an indorsement proportionate to the reputation of the authors. Here we have the acid theory and the alkaline theory,—the hot, the cold, and the tea and the saleratus theories, besides many others to which I have not alluded. So far as my observation extends, the acid theory has had most advocates, embracing most of our modern writers upon dental pathology. But are all these authorities right and only right? Were Hippocrates and Ribè both wrong and only wrong? Is there anything incompatible in the opposing doctrines that acids or alkalies alone are the main cause of defective teeth? Recent discussions upon the question under consideration reveal, as I think, an approach to the true solution, or at least seem to unlock some of the hidden recesses wherein lie the enemies of sound teeth. I am not prepared to receive as entirely orthodox the theory of direct agencies, whether of the acid or the alkaline class, and submit that such position will not bear the test of unbiased and intelligent investigation. That in a state of health the teeth are thus destroyed, I very much doubt, notwithstanding the fact that in certain physical conditions the fluids of the mouth may exhibit an excess of either principle, but not in destructive amount. We must look beyond all local agencies of either type, and insist upon a strict adherence to the laws of our being before we can claim immunity from the penalties which their infraction is sure to visit upon us.

Rising above the thralldom of conflicting opinions, an unobstructed view of the case seems to favor the aggregation of all the agencies as the disturbing tyrant to whom we pay such heavy tribute. Certain foci within the domain of fashionable civilization seem to furnish the greatest number of cases of dental caries, and also of gray hair, speaking relatively to the world at large, and these foci will be found in our cities and fashionable towns where eating, drinking, late hours, and vexatious cares drain alike the body and the soul, consigning both to premature decay and nothingness. Faulty nutrition and assimilation, allow me to suggest, underlies the evil in question; nor does defective, perverted, or insufficient nutrition depend entirely upon what we eat, but rather upon what, when, and how we eat and drink, and how we occupy our time.

We find those most regular and correct in their habits, physically, mentally, and morally, have least occasion for either lawyer, doctor, dentist, or parson, while the devotee of self frequently requires the aid of them all.

Suppose a man to eat nothing which in itself could produce any derangement of the animal economy, still if eaten in disregard to the fact that the teeth were made to use, the result is apparent—the stomach has double work to do and cannot long perform its legitimate functions to the acceptance of the aggregate whole, and supply and waste are not kept in harmonious equilibrium. The vital forces struggle for the maintenance of the more important and vital organisms, and leave those which we seem to prize less than we ought, to an easy destruction and the tender mercies of the dentist. As with eating, so with the entire list of abuses with which we iniquitously inflict our mortal bodies, leaving their marks upon us and descending as an unwelcome inheritance to our children. When the time shall come when man in the full light of intellectual vision can look through nature up to nature's God, and obey the reasonable behests of the organic laws which dwell within and about us, then may we expect comparative immunity from dental caries. My limits have not permitted any attempt to elaborate—nor do I think you desire that I should do so. Whatever theory or combination of theories will afford the true explanation of decay in teeth I will most heartily indorse, whether in keeping with my present convictions or not, and hope the day is far distant when any of us will feel that there is nothing more to learn.

PAIN—ITS BENEFICENT USES, AND MEANS OF ALLEVIATION.

BY J. H. McQUILLEN, D.D.S.

Synopsis of an Address delivered before the Hartford Society of Dentists.

A SPECIAL meeting of the Hartford Society of Dentists was held at Central Hall, Monday evening, April 30th, at which Professor McQuillen, of Philadelphia, delivered, by invitation of the society, a lecture upon "PAIN, ITS BENEFICENT USES AND MEANS OF ALLEVIATION." The lecture was an oral one, without notes, and illustrated by diagrams, papier-mâché preparations, etc. of the nervous system.

C. M. HOOKER, *Secretary*.

LADIES AND GENTLEMEN:—Some present, no doubt, would be disposed to question the application of beneficence, or "active goodness," in connection with pain; and such parties would beyond a question of doubt take decided exceptions to the enunciation of an aphorism that is irrefutable, viz., that pain, in place of being a *curse*, is in reality a *bless-*

ing. In confirmation of this it is only necessary to direct attention to the fact that but for the pain which is experienced when an internal organ becomes diseased, as the liver, the heart, the lungs, the brain, etc., the disease might progress to such an extent that not only the organ but life itself would be placed in jeopardy. The uncomfortable or painful sensation, however, experienced by the patient, intimates to him that there is something wrong; and under judicious treatment the cause of the affection is eradicated. Pain thus becomes a *safeguard* to the patient and a valuable means of *diagnosis* to the medical and dental practitioner. Again, the child that burns its hand, learns the valuable lesson to let live coals alone; the young man who suffers from an aching head after indulging for the first time in bacchanalian revels, is taught perchance to avoid such things in future. The child that is punished for its disobedience may be induced by the pain he experiences to mend his ways. In this connection, however, sensible parents must agree with the Rev. Henry Ward Beecher, that it is not advisable to strike children on the head when a more appropriate place has been provided for the reception of parental castigation.

To properly apprehend the subject, it will be necessary to present a general summary of the nervous system through which we *feel*; for the animal kingdom alone is endowed with *sensation* and *voluntary motion*. As LINNÆUS, the great framer of precise and definite ideas of natural objects, justly remarked :

“Minerals are unorganized; vegetables are organized and live; animals are organized, live, feel, and move voluntarily.”

In passing from the lowest to the highest forms of animal life, very great differences are presented in the arrangement of the nervous system; although they agree in the essential particular of consisting of two substances,—the gray, or vesicular matter, and the white or tubular, which, united together, constitutes a ganglion or nerve-centre, with the white or tubular portion passing from it, or to it, as nerves of motion or sensation. Thus in CUVIER'S SUB-KINGDOM, the RADIATA (*radius*, a ray), the star-fish, for instance, five ganglia surround the mouth of the animal, with nerves passing from one ganglion to another, and to each of the rays or limbs. In the MOLLUSCA (*mollis*, soft), the oysters, snails, etc., one or more ganglia are observable with nerves passing to the different organs. In the ARTICULATA (*articulus*, jointed), the crabs, lobsters, centipedes, bees, etc., a higher development of the nervous system is presented than in the preceding, the ganglia being arranged symmetrically along the axis or centre of the body, with nerves passing from them to the extremities. The ganglia found in the head of these, although unlike the brain of the vertebrate animals, have similar organic relations; that is to say, being in connection with the higher organs of sense, we have no hesitation in speaking of the brain of a bee, although the amount

of intelligence it may possess is difficult to estimate, but it is readily demonstrable that it manifests sensation, voluntary motion, and instinct in a high degree; in other words, it *feels, moves, and acts*. There is more of poetic imagination, however, than truthfulness in the assertion of SHAKESPEARE, that

“The poor beetle that we tread upon,
In corporal suffering feels a pang as great
As when a giant dies.”

This fact, however, is no reason for inflicting unnecessary pain upon such creatures, as they have as good a right to live, and enjoy their existence as man, or they would not have been created.

In passing to the highest forms of animal life, the VERTEBRATA (or those possessing back-bones), it is found that in addition to the ganglia already described, there is a nervous mass—the SPINAL CORD—occupying the vertebral column or spine, and a ganglionic expansion of this SPINAL CORD, or the BRAIN proper, safely lodged and protected in the skull of each animal. The brain, however, differs in size, shape, and function, according to the CLASS of animals, increasing in the number of *Sensory ganglia* from FISHES to REPTILES, to BIRDS, and to the MAMMALIA, until eventually culminating in MAN, the highest type of the nervous system is presented. In him the nervous system is divisible into *three portions*: 1st, the *Cerebro-Spinal*, or that which presides over *voluntary* motion, including the brain and nerves passing from and to it as a centre, and through which any part of the body is moved responsive to the will; 2d, the *True Spinal*, or the *involuntary*, with the spinal cord as a centre, having nerves passing from and to it, and by means of which the rhythmical action of the heart and lungs takes place; 3d, the *Great Sympathetic*, consisting of a series of ganglia (five of which are found in the skull, and the rest in front of the spinal column) sending off nerve fibres to each other, to the nervous system, already referred to, and the different organs of the human economy. With a nervous system such as this, man, like animals, not only *feels, moves, and acts*, but, possessing a highly organized brain, is able to perceive impressions, remember, compare, and think over them; and, enjoying moral and mental aspirations, and the gift of language, can communicate his wants and desires, his hopes and fears, his joys and sorrows to his fellow-man. In this respect, however, men differ very much from each other; some are more keenly alive to the impressions that are made upon them; are more sensitive, and suffer more in proportion than those whose sensations are rather obtuse. While thus doomed to suffer intensely, they enjoy the compensation of a keener appreciation of the exalted pleasures of the world, and as the poet has remarked, can truly say

“In my large joy of sight and touch,
For what others count as such,
I am content to suffer much.”

The sensations perceived, whether of pain or pleasure, are due to impressions made upon the nerves, and conveyed by them to the brain. *Sensation* is divisible into two kinds: 1st, *general sensibility*, or that through which we take cognizance of variations of temperature, the contact of hard or soft substances, or of disagreeable impressions in any portion of the body; 2d, *special sensibility*, as the sense of sight, hearing, smell, taste, and touch (the last of which is nothing more than exalted general sensibility). The four *special* nerves distributed to the organs of *sense* just named cannot take upon themselves any other office than that for which they were specifically formed, and are not even endowed with general sensibility. The organs to which they are distributed, however, are supplied with branches from what is called the *fifth pair of nerves*, which give them common sensation. This nerve, arising from the posterior portion of the brain, and passing forward, eventually divides into three great branches, the first of which passes to the eye, the second to the upper jaw and superior teeth, the third to the lower jaw and inferior teeth; in addition to this, small branches are given off which pass to the face, to the ear, to the nose, and the tongue, and the painful sensations which are felt in these various parts are due to impressions made upon this nerve. Thus when a grain of sand gets into the eye, the pain experienced is not owing to impressions made upon the *optic nerve* (for that is only sensible to the light), but upon this nerve; and when the pulp or nerve of a tooth becomes exposed, the painful sensations are owing to irritation of the extremities of this nerve. Painful sensations are sometimes very deceptive in their character, the mind referring the seat of pain to an entirely different locality from that in which it originates; thus when the elbow is struck, in place of the pain being felt there, a tingling sensation is experienced in the fingers, or at the terminal extremities of the *ulnar nerve*. In disease of the hip-joint, the pain is referred to the knee; in affections of the liver, the pain is felt in the right shoulder; and in that horrible disease, *angina pectoris*, the painful sensation, instead of being confined to the heart, extends along the left shoulder and arm; again, a perfectly sound tooth is frequently pointed out by patients as intensely painful, when in reality some neighboring tooth is the seat of trouble; or a diseased tooth may induce painful sensations in the eye, the ear, or any other portion of the body, through what is called *sympathetic irritation*.

It is the knowledge of these facts which enables the scientific and skillful medical and dental practitioner promptly to relieve the sufferings of his fellow-man; for although, as has been asserted, pain is a blessing in disguise, it is the duty of the physician to *relieve* and not *inflict* pain, and he should therefore make use of every means in his power for the alleviation of suffering.

In this connection, reference was made to the important discovery of

anæsthesia by the late Dr. Horace Wells, of Hartford, and a tribute of respect was paid to his memory as having been instrumental in conferring upon man one of the greatest blessings vouchsafed by an all-wise Providence. The wish was expressed that a grateful people, who have enjoyed the beneficent advantages arising from this boon, would make ample provision for his widow, and erect over his mortal remains a monument suitable to commemorate such a great and glorious discovery.

OBSERVATIONS ON THE GROWTH AND ABSORPTION OF THE ALVEOLAR PROCESS.

BY JOHN BRANIQUE, OF NEW YORK.

IN the standard works on the sciences of physiology and pathology, which I have examined in reference to this question (and they comprised almost all within my reach), I do not find that the phenomena to which my observations refer have received any consideration. They appear, in fact, to have been overlooked. Possibly they may have been observed and recorded in some of the medical or dental journals and have escaped my notice.

The question which gave rise to the reflections which I propose to make not being a speculative one, but one which was submitted to me in actual practice, cannot, I think, be more clearly stated than by giving a history of the case in which it originated.

A doctor of medicine, to whom I am indebted for some kind offices and most valuable professional services, and whose position as professor in one of our State medical colleges justifies the most respectful consideration for his opinion, recently called at my office, accompanied by a lady and her son, a boy seven or eight years of age. The mother mentioned to me that this boy had been extremely delicate from infancy, and she attributed his existence up to this period, under Providence, to the care that was bestowed upon him, and the judicious treatment he received from his medical attendant.

I was requested to extract from this boy, who, as it appeared to me, was of a strumous diathesis, a deciduous cuspidatus that had caused pain and some inflammation. I suggested that it was not considered good practice on the part of a dentist to remove from a child of his age a deciduous tooth that was not usually shed before the eleventh or twelfth year.

In reply, the doctor observed that he feared the periosteal inflammation then present, and the death of the tooth that was likely to ensue from it, would cause the death and exfoliation of the alveolar process, and leave the permanent tooth that was to occupy the same position without its appropriate support. From this view I totally differed. I could observe that there lay behind those reasons (which I asserted at the time were not sufficient to justify the removal of the tooth) a desire on the

part of the doctor to remove every irritating cause that would be likely to affect the very feeble recuperative power of his patient. But looking at the case from his stand-point, and recognizing his perfect competency to comprehend the question in all its bearings, I removed the tooth under his direction, he having assumed the responsibility.

Now the question to which I am desirous of calling attention presents itself. Are the alveoli of the deciduous set of teeth the alveoli of the permanent set?

The examples of the entire or partial removal of organs and tissues that have ceased to perform their functions, or that are no longer necessary in the economy, and the changes that take place in others corresponding with existing conditions, are too numerous and too well known to require restatement. In all of these cases the general law of the organism is obeyed. But in this case, are the alveoli of the deciduous teeth an exception to this general law? Are they made to subserve another function, a new one? Are they made to support the permanent teeth for which they are not adapted in shape or size (unless by an alteration equivalent to renewal), or are they removed, together with the organs to which they gave support, in obedience to the general law, after having subserved the specific function for which they were intended?

The generally accepted theory on this point is: that the alveolar process (the first alveolar process, observe, as no other process is alluded to) performs both of these functions—that is, the support of the permanent as well as the deciduous teeth. It is so laid down by authorities on those questions, or it must be so inferred, as the contrary is not stated, otherwise the doctor would not have ordered the removal of the deciduous tooth under consideration. But fearing that the inflammation attendant upon it would cause the death and exfoliation of its alveolar process, and that the permanent tooth which was to replace it would consequently lose its support, he logically ordered its extraction, thereby reducing the above theory to practice.

I question the correctness of this theory, and propose to disprove it by the following observations:

The antero-posterior diameter of a deciduous central incisor at the neck is.....	2 lines.
Its lateral diameter at the incising point is.....	3 lines.
And its length is.....	7 lines.
The antero-posterior diameter of a permanent central incisor at the neck is.....	3 lines.
Its lateral diameter at the incising point is.....	4 lines.
And its length is	12 lines.

It is obvious, therefore, that the alveolus of the deciduous incisor is entirely unsuited to the size of the permanent one that takes its place, and that the latter, in consequence of its larger lateral diameter, must have removed, in its progress to the surface, the septa on one or both sides of the deciduous incisor in question, and that new septa must have been

formed corresponding to the diameter of the permanent incisor, growing *pari passu* with it, and consequently forming a new alveolus for it.

The alveolus that was only just sufficient to envelop the fang of a deciduous central incisor 2 lines in diameter at the neck, and 7 lines in length, would certainly be insufficient to envelop the fang of a permanent incisor 3 lines in diameter at the neck, and 12 lines in length.

In the next place, the first and second molars of the deciduous set are replaced by the first and second bicuspidati of the permanent set.

The deciduous molars of the superior maxillary bone are three-fanged teeth, occupying a space in the dental arch nearly twice as great as the premolars that are to replace them, the latter generally having only one fang, or two fangs compressed into one, rarely two distinct ones.

Upon what hypothesis can the change be accounted for which takes place in alveoli, that at one time support teeth of a certain diameter with three very divergent and short fangs, and at another time support teeth of half that diameter with only one long fang, unless it be that the deciduous alveoli are removed altogether, and new ones formed that grow and accommodate themselves to the premolar fangs that are so different in shape, length, and diameter from their predecessors?

This hypothesis is not unreasonable if we take into account the physiological operation of the removal, by absorption, of the fangs of the deciduous teeth, the *modus operandi* of which, by-the-way, is not yet definitely established; one set of observers asserting that the absorption is attributable to pressure, and another set that it results from the action of a highly vascular membrane. I incline to the latter opinion, and will give my reasons hereafter. But, one way or another, it is conceded that the absorption does take place. We see, in fact, that all obstruction to the growth of the budding permanent tooth is removed, temporary alveolus as well as temporary fang, for the tooth could not come to the surface, in consequence of its greater size, unless the former obstruction was removed as well as the latter. It follows as a matter of course that provision must be made to supply a new alveolus in place of the one that was removed or absorbed. We see, in fact, that a new alveolar process is supplied of larger size, of greater strength, and suited in all respects to the larger sized and differently shaped tooth that it is required to support.

If it is contended that I cannot quote the authority of any physiologist in support of the hypothesis which I assume, viz., that there is a new growth of alveolus, I concede that I cannot do it. But I claim that my view of the question is a new one altogether, not observed before, or at least not recorded as far as I have seen. However, if I cannot bring the authority of the physiologists to support my hypothesis, I think I can find evidence for it in the cranium.

In the child's skull I can point to the alveoli of the first and second deciduous molars, with their three sockets for the three fangs of each

molar. And in the adult skull I can point to the same place, heretofore occupied by two deciduous molars of wide diameter, with three fangs each, but now occupied by two teeth of little more than half the diameter of their predecessors, with only one fang each, and the alveoli corresponding exactly to the single fang, and not a vestige of the alveoli of the three-fanged teeth remaining.

It may be argued that it has been already noticed that the teeth have had new alveoli supplied to them, and that many cases are reported where portions of the jaw were removed by violence or disease, leaving the fangs of some teeth exposed and unsupported; and where the latter have had new alveoli supplied to them by a new growth of bone. Mr. Tomes reports a case where necrosis of the jaw ensued from periosteal inflammation of a molar tooth, and where a large sequestrum was removed, embracing two-thirds of the outside plate of the lower jaw, including the symphysis, but leaving the teeth undisturbed, and where the injury was repaired by deposit of bone over the entire surface, thus securing the teeth. It may seem that the formation of a new alveolus is here recorded, but it is not so in the proper acceptation of the word. It was the pathological reparation of an injury done, entirely distinct from, and must not be confounded with the physiological operation to which I wish to call attention.

Here I may be pardoned for taking a cursory view of what has been written by physiologists on the alveolar process.

In Dalton's work on physiology, the most recent authority that I have seen, I find the digestive organs, their functions, and the whole process of digestion described in the most elaborate and lucid manner; but the author merely alludes to the teeth as the tritulating organs by which the food is comminuted and prepared for digestion, and makes no further allusion to them or their alveoli in that connection.

It is true that in the scope and design of his work he did not contemplate a description of the whole phenomena embraced in the science of human physiology. But it is to be regretted that the teeth (situated as they are at the commencement of the alimentary canal, and performing as they do so important a function in the process he so minutely describes in other respects) did not receive that consideration the eminent author was so well qualified to bestow on them and their alveoli.

In the course of lectures on Dental Physiology and Surgery, delivered by Mr. Tomes at the Middlesex Hospital School of Medicine, London, a course specially designed to elucidate every feature, function, and disease of the teeth and maxilla, one would suppose that so important a process as the alveolus would have received the consideration to which it is entitled from its near relation to, and upon which the teeth are so entirely dependent. But although he describes most minutely the manner of formation of the dentine, cementum, and enamel, of which the tooth is composed, from the first cytoblastic cell in the papilla through the

various changes of form it undergoes, until its ultimate and complete development,—quoting all the authorities from Purkinje and Retzius to Goodsir and Nasmyth,—yet he dismisses those cradles of his nurslings in one short paragraph. And this is the more singular as the alveoli are the appurtenances of the teeth, and essentially belonging to them, rather than to the maxillary bones, with which they have little or no function in common.

Carpenter also follows in the footsteps of his predecessors, afraid, I suppose, to deviate from the established and often-trodden path of investigation. In this respect he pursues the same course as Mr. Tomes, and quotes Goodsir *ad infinitum*. Goodsir, by-the-way, disposes of the whole subject of the alveolus thus: “It is during this period (the saccular) also, that the ossification of the jaw is being effected, and that the bony sockets are formed for the teeth by the consolidation of the anterior and posterior ridges bounding the alveolar groove (in which the dental groove was imbedded) and of the interfollicular septa, which are produced by the meeting of the transverse projections from these ridges.” But neither he nor Carpenter says one word of the subsequent changes that take place.

I find in Todd and Bowman’s Physiology, page 180, the following reference to the alveolus: “As the permanent teeth are prepared to penetrate the gum, the bony partitions which separate their sacs from those of the temporary teeth are absorbed.” But this, you will observe, has reference to the cutting through of the permanent tooth from its own cavity of reserve into the sac of the temporary tooth.

Kölliker, on page 487 of his work, edited by Dr. Da Costa, of Philadelphia, uses the words, “alveoli of the permanent teeth,” but he only does so in describing the same operation as that above described by Todd and Bowman. And in using these words, he does not make the nice distinction of the latter authors, who remember that both the cavity of reserve of the permanent tooth and the sac of the temporary one are contained in the alveolar process. At the stage of the development of the permanent teeth to which he refers, it is the walls of the cavity of reserve that are absorbed, and not the alveolus.

In works on anatomy there is no information to be found on this subject.

Wilson, F.R.S., disposes of the alveolus thus: “The alveolar process forms the lower portion of the bone (the superior maxillary); it is spongy and cellular in texture, and excavated into deep holes for the reception of the teeth.” But, like many others, he falls back on the inevitable Goodsir, and quotes extensively from him on the development of the teeth, but goes no further.

Gray, F.R.S., disposes of the question in an equally cursory manner, but mentions that “at an early period of life, before the eruption of the

teeth, the alveolar process is proportionally larger and deeper than in the adult, and the chief part of the body is above the oblique line. In adult life the base of the bone attains its maximum development." Now the first proposition had been previously observed by Goodsir, and the next is the natural inference.

Joseph Fox, M.R.C.S.L., in his *Natural History of the Human Teeth*, edited by the late Chapin Harris, of Baltimore, notices the growth and diseases of the alveolar process more fully than any of the authors whom I have quoted, but he makes no allusion to any change that takes place in it except in a pathological sense.

I have examined Owen's *Odontography* in search of information on this question, but he is silent on it, confining himself altogether to the investigation of the development of the teeth.

I need scarcely say that in thus commenting on the absence of information on this subject, in the works of those eminent men to whom I refer, whose names will be remembered with the sciences which they have illustrated, that I have no captious desire to criticise or find fault, but simply to call attention to the fact that this phase of the question has been overlooked by them.

Now I may assign my reasons for favoring the theory that the fangs of the deciduous teeth are removed through the medium of a vascular membrane rather than by pressure.

All medical men, as well as dentists, who have opportunities of extracting deciduous teeth, may observe that the second deciduous molars that are ready to be shed about the eleventh year, are, when the crowns are in a perfectly sound condition, held in their positions by being firmly impacted between the first permanent molar that came into position in the sixth or seventh year, and the first bicuspid, that had come into position in the tenth year. So firmly impacted are these second deciduous molars, that it is difficult to realize that they do not still retain their fangs entire. Let the operator extract a second deciduous molar, such as I describe, and what will he observe? He will, in the first place, observe that he has merely the enamel that covered the crown of the tooth in his forceps, completely cupped out from the inside with every vestige, not alone of the fangs removed, but of the dentine that formed the crown, and not a trace of blood on it. Now let him examine the part from whence he extracted this deciduous molar and he will observe, not the point or points of the second bicuspid sticking up, as if it (the bicuspid) had removed the fangs by pressure, and had penetrated into, and was the cause of the cupping of the enamel by the removal of the dentine that formed the crown, but he will observe a highly organized vascular membrane, with minute red spots over the surface, not bleeding, shaped very obtusely conoid, exactly the reverse shape of the cupped enamel, looking as if it had penetrated into, and was the cause of the removal of the den-

tine of the crown. Let the operator now take a probe and perforate this membrane, and he will find that it is highly vascular, bleeds freely, is without sensitiveness, and that the bicuspid lies so far beneath its surface that it (the bicuspid) could have had no primary agency whatever in the removal of the dentine by pressure.

I am aware that there are some grounds for the other hypothesis, in the fact of the partially absorbed fangs of the deciduous teeth having the reverse shape of that part of the coming tooth with which it was in contact, but it is not sufficient to explain the removal of the crowns of the second deciduous molars. We must remember in this connection that many permanent teeth are kept down in the alveolar process by the resistance offered by the unabsorbed fang of the tooth lying over it, showing that there was something more wanting than pressure to absorb the fang. Might it not have been the absence of the vascular membrane?

Another observation led me to favor the theory of absorption through membranous agency rather than by means of pressure. I will mention it, although it was but a solitary example. A child nine years of age, of a highly vigorous constitution, and of a pure sanguine temperament, was presented to me to have a deciduous lateral incisor extracted. The permanent lateral that was to take its place had cut through the gum on the outside margin instead of the inside, as is most usual, and was about two-thirds grown. An unusual turgescence of the gum surrounded it at the free margin of the gum. After removing the deciduous tooth, I proceeded to examine the unusual appearance of the gum, and found a small, vascular cyst, of a bright vermilion color, ovoid in shape, and of about one and one-half to two lines in its narrow diameter, lying partially under, and partly free of the festoon of the gum. It was not attached to the gum, but to some part higher up, as appeared from the length of the neck, which was about two lines, and which I laid hold of by a small spring pliers in removing it. It was imbedded nearly one-half its own diameter in the labial surface of the permanent tooth partly on the neck. And the cavity in which it lay had the roughened feel of a cavity formed by some absorbing agent. I regarded the cyst at the time as the agent, and the cavity as one formed by absorption.

I regret that my researches do not enable me to point out how the changes in the alveoli to which I have referred have taken place; but I purpose to prosecute the inquiry further, and earnestly solicit information on the subject, lest I should have the misfortune of falling into the error common to many investigators of natural phenomena, viz., that of first propounding a theory and then distorting facts to support it, instead of first observing the facts and then founding the theory upon them. However, there are many instances of great facts having lain unobserved for ages, until theories were propounded which led to their discovery.

If the present imperfect paper should be the means of attracting the

attention of the profession to the subject of which it treats, and of eliciting a discussion that will throw additional light upon it, I shall be amply compensated for whatever labor it has cost, and will rest satisfied in feeling that it has not been written in vain.

CHIMOGENE—AN IMPROVED SUBSTITUTE FOR RHIGOLENE, ETHER, AND OTHER ANAESTHETICS.

BY P. H. VANDERWEYDE, M.D.,
LATE PROFESSOR OF CHEMISTRY, GIRARD COLLEGE.

IN experimenting with the highly volatile and gaseous products of distillation, I succeeded in producing a liquid boiling at any desired degree of temperature, say at 60°, 50°, 40°, or even at 30° F., causing by its evaporation the most intense cold. I propose therefore to call it *Chimogene* (cold generator).

The desired degree of its boiling point depends only on a slight modification in its preparation; in fact, it may be made so volatile that it requires very strong bottles and careful stoppering to hold it, as by lifting the stopper it foams like champagne, boiling at the common temperature; pouring it from the bottle in drops or in a small stream, it will be evaporated before reaching the floor.

Having just read on page 601 of the last number of the DENTAL COSMOS the remarks about the want of such a liquid for anæsthetic purposes, it struck me that this was the very thing needed, and I hasten, therefore, to bring this discovery to the knowledge of the profession.

CUVIERIAN CLASSIFICATION OF ANIMATED NATURE.

BY J. H. M'QUILLEN, D.D.S.

An Address delivered before the Central Massachusetts Dental Society, May 1, 1866.

LADIES AND GENTLEMEN:—Fully recognizing the difficulties that environ the presentation of a scientific subject to an audience composed of professional and non-professional persons, of succeeding in interesting and instructing the latter, and at the same time satisfying the former, is indeed a difficult, if not an impossible task. To secure and maintain the attention of those entirely unfamiliar with the subject, one must generalize to a great extent, and particularly avoid the extended details and the use (to a certain degree) of scientific nomenclature, which would be proper before a body of strictly professional men. Influenced by considerations such as these, in directing attention to the subject-matter of the evening, in the brief time allotted, I shall, of necessity, be compelled to treat it in the most general manner, but it is hoped in a sufficiently suggestive and

interesting way to awaken a desire on the part of some present to enter upon the study of natural history. If this end should be accomplished, the effort will not have been futile. Man must have his pleasures in this world, and it is far better that those pleasures should lie above rather than below the diaphragm, that they should be of a character to advance and elevate rather than to debase and degrade him. SOCRATES said to his disciples that the most forcible and truthful axiom he had ever met with, was that inscribed upon the temple of Delphus—"Know thyself." What nobler or more interesting study can there be than that of man viewed morally, mentally, and physically? To thoroughly understand man, however, and his place in nature, it is necessary to examine his surroundings of the inorganic and organic world, that we may properly appreciate whence he comes, and whither he goes. Fortunately for us, owing to the efforts of such master-minds as LINNÆUS, CUVIER, OWEN, AGASSIZ and others, the organic world has been classified in such an orderly and methodical manner that its study is far more easy than it was prior to their time. To CUVIER in particular, the comparative anatomist and the world at large is under lasting obligations, for although in some slight particulars his classification of animated nature has been modified, the accuracy of the plan, as a whole, is made manifest by its universal adoption on the part of naturalists. The knowledge which we possess of the structure and habits of many animals, however, is exceedingly imperfect, and ample opportunities are afforded for those whose tastes lead them in such directions to contribute to the general stock of information, and as an incentive to exertion, it may be stated that new species are being constantly discovered by those who devote themselves to such pursuits. We esteem it a privilege, and eminently improving, to make ourselves familiar with the thoughts of the leading minds of this world, who, like ourselves, are erring and fallible men; but how much more elevating and liberalizing is the study of the works of One who is *infallible*, and manifests boundless wisdom and beneficence in all his works!

Prior to the consideration of the classification of animated nature, it will be advisable to refer briefly to the differences between inorganic and organic matter,—minerals being arranged under the head of the inorganic, vegetables and animals under the organic. In the inorganic there are no organs for the performance of specific functions, and no such thing as birth, life, or death; in the organic, on the other hand, all of these prevail, and organized bodies being derived from similar ones, the necessity for parents seems to be invariably manifest; and the axiom of HARVEY, "*omne vivum ex ovo*," from a seed or egg every living thing arises, appears to prevail throughout. The theory of *spontaneous generation*, which supposes that living objects may arise by the conjunction of the elements of decaying animal or vegetable matter, has been subjected of late to the most rigid examination, and becomes more and more improbable the closer it is investigated.

In form, size, chemical composition, preservation, and duration, the contrast is most striking between the inorganic and organic. Inorganic matters are aeriform, liquid, or solid, and are prone to assume the crystalline form, and the smallest particle of chalk is the same in structure and composition as the largest chalk cliffs on the sea-coast. These may exist apparently unchanged for ages. Organic bodies, on the contrary, consist of an assemblage of organs, each body has a definite form and size peculiar to its species, by which it is distinguished from all others, and the evidence of incessant change in them is readily observable. Inorganic bodies, by chemical analysis, may be resolved into about sixty-five simple substances or elements, that is to say, which have hitherto resisted decomposition on the part of the chemist. These elements unite in certain definite proportions to form the compound inorganic substances which surround us on all sides. Of these sixty-five simple elements, only about seventeen enter into the composition of organic bodies, vegetable or animal.

The preservation of the individual makes it necessary that organized bodies should be supplied with food. This the plant obtains by absorbing to itself inorganic matters, such as carbonic acid, water, ammonia, and the earthy salts, from the surrounding atmosphere and soil, and animals feeding upon vegetables and upon each other secure materials sufficient to supply the waste which is constantly going on in their organisms. It is not only necessary to attend to the preservation of the individual, but the perpetuity of the species is equally important, and this is secured by the union of the sexes. The duration of the individual is limited; in other words, it has a definite period of existence, divisible into ages, at the termination of which death invariably ensues, and the material which entered into the composition of the vegetable or animal is returned to the earth and atmosphere, from which it was originally obtained, to be again resolved into the simple elements. Even during life, however, this constant interchange between the inorganic and organic is taking place; in every act of respiration, oxygen is obtained from the atmosphere in inspiration, and carbonic acid gas given off to it in expiration; the food that is taken into the body, vegetable or animal, is only so much matter which was originally obtained from the inorganic world, and after subserving the purposes of the economy, is again returned to the source whence it came in the different excretions of the body. Constant change is thus taking place, not only in the organic, but also in the inorganic world, the former absorbing materials from the latter at one time, to be replaced at another. The elements which enter into the composition of our body indeed are only borrowed from the earth and surrounding atmosphere, and united together by the operation of the natural forces, and then, after a brief period, this relation is dissolved, and the constituent elements separate, to again enter into new combinations. This constant absorption from and return of ma-

terials to the earth and atmosphere by organized beings keeps up the continuous stream of life, and renders the source inexhaustible. The REV. MR. MALTHUS, an eminent mathematician, demonstrated years ago, by a most minute and accurate calculation, that if there was not constant death as well as birth, organic beings, increasing under such circumstances, in a geometrical ratio—and as the means of existence cannot be made to increase in the same ratio—a condition of affairs eventually would be reached when there would be neither food nor space on the globe sufficient to accommodate the necessities of vegetables and animals. The constant interchange between the organic and inorganic, in the dying out of the old, not only affords place for the new, but also gives to the face of nature the freshness and vitality which are so pleasing to our senses and so invigorating to our physical and mental powers. The fossil remains in the geological strata indicate most conclusively that ages upon ages long before the world was habited by man, or was a fit place of habitation for him, death prevailed among vegetables and animals. In this record, the grave-yard of past ages, is exhibited in chronological order one of the most beautiful evidences of the harmony of nature's laws, and the wonderful system and wisdom of God: first creating the lower forms of organic life, and then in different geological ages, through successive stages of advancement, one class of animals after another appearing, until eventually the world is prepared for the maintenance of man. Thus, in the PRIMARY OR PALÆOZOIC AGE, FISHES were the masters of creation; in the SECONDARY AGE air-breathing animals first appeared, the REPTILES predominating over other animals; in the TERTIARY AGE, terrestrial MAMMALS of great size present themselves; while it is not until the MODERN AGE that the reign of MAN begins. In the TESTIMONY OF THE ROCKS, by HUGH MILLER, and in the RELIGION OF GEOLOGY, by the REV. DR. EDWARD HITCHCOCK, President of Amherst College, are embodied conclusive arguments in substantiation of the statements relative to fossil remains. The facts presented indicate most clearly that the matter which entered into the composition of animals and vegetables in the earliest period of the world is still in existence; and that we are formed of materials as old as the creation, which have served the purposes of beings anterior to and during our own time, as we, in turn, by constant disintegration of our tissues, yield up the matter of which we are composed, to furnish material for new existences. What we call death or destruction is not therefore *annihilation*, but change, for there is no such thing as the annihilation of matter or of force; either may disappear from our view, but they are not destroyed, they are only changed in form, and will reappear in some other shape. In illustration of this, BRYANT, America's great poet of nature, has forcibly said:

“Go forth, under the open sky, and list

To nature's teachings, while from all around

Earth and her waters, and the depths of air,
 Comes a still voice. Yet a few days, and thee
 The all-beholding sun shall see no more
 In all his course; nor yet in the cold ground,
 Where thy pale form was laid, with many tears,
 Nor in the embrace of ocean, shall exist
 Thy image. Earth, that nourished thee, shall claim
 Thy growth, to be resolved to earth again,
 And, lost each human trace, surrendering up
 Thine individual being, shalt thou go
 To mix forever with the elements,
 To be a brother to the insensible rock
 And to the sluggish clod which the rude swain
 Turns with his share, and treads upon. The oak
 Shall send his roots abroad, and pierce thy mould."

To some persons, the idea that the materials that enter into the composition of their bodies is to be thus used may carry with it rather unpleasant associations. To a sentient being, however, who, in his day and generation does everything in his power to ameliorate the sufferings, contribute to the happiness, and elevate the condition of his fellow-man; who recognizes that, while made in the *spiritual* image of God, he has a *material* body like that of other animals, which is but a dwelling-place for the spirit during a brief period, and when the tenement becomes unfit for it as a place of habitation, returns to the source whence it came, there is something delightful in the consciousness that even the materials which form part of his organism are not to be wasted, but, on the contrary, will be employed for some useful purpose, perchance to become part and parcel of a noble oak, that shall please the eye, and shelter from the storm or the heat of the sun a fellow-being; or enter into the composition of a beautiful flower, whose fragrance shall impart to the surrounding air an aroma grateful and exhilarating to all.

(To be continued.)

REMOVING WAX FROM MOULDS.

BY J. S. SCOTT, COBOURG, C. W.

PROF. RICHARDSON, in his Mechanical Dentistry, directs that, "as soon as condensation of the plaster takes place, the flask should be placed in a hot-air chamber, or on a stove, and heated throughout sufficiently to soften, but not to melt, the wax." The following process, to the writer, is more satisfactory. As soon as the flask is filled and clamped, place it at once in boiling water; when the wax is melted, loosen the clamp slightly, so as to allow the wax to escape into the water; boil say five minutes longer, when the flask can be removed and opened, the moulds will be found hard, and quite ready for packing; the model will be suffi-

ciently hard without the tin foil covering,—a desirable point, as the foil, by increasing the size of the mould, interferes somewhat with the fit of the plate. After packing, place the flask again in boiling water, taking it out occasionally to tighten the clamp, until the sections of the flask are brought completely together. By heating in an oven or on a stove there is danger of burning the rubber.

PUBLISHER'S NOTICE.

THE present number closes the seventh volume of the DENTAL COSMOS. The first number of the eighth volume will be issued August 1st. The journal will be continued under the supervision of its former editors, DR. J. H. MCQUILLEN having charge of the Original Contributions, and DR. GEO. J. ZIEGLER of the Periscopic Department.

PROCEEDINGS OF DENTAL SOCIETIES.

REPORT OF DISCUSSIONS OF THE SOCIETY OF DENTAL SURGEONS OF THE CITY OF NEW YORK.

BY J. S. LATIMER, D.D.S.

AT the annual meeting in March, the following gentlemen were elected officers of the Society:

President.—George E. Hawes.*

1st Vice-President.—C. P. Fitch.

2d Vice-President.—B. W. Franklin.

Recording Secretary.—John M. Crowell.

Corresponding Secretary.—J. C. Sproull (31 Bible House).

Treasurer.—C. D. Allen.

Librarian.—J. S. Latimer.

At the meeting held March 28th, the subject being "Materials for Filling Teeth,"

Frank Abbott stated that he likes Watts' No. 1 crystal gold, but he had for the last few months used Atkinson's No. 3 foil, and gives it the preference over every other preparation. He does not like Wood's alloy. Has not used it himself, but has seen many failures in the operations of others which led him to believe it unable to stand the action of the fluids of the mouth. Would sooner trust Lawrence's amalgam. Fillings of crystal gold, which he had inserted with great care, he had found discolored a month afterward, but only on their exposed surfaces. Did not

* G. E. Hawes declining to serve, C. P. Fitch was subsequently elected in his place.

undertake to account for this nor for the "crumbling" which he had heard of taking place within three months after insertion. Had a case of the latter difficulty in his own practice, but that he deemed due to "chopping" with very fine points. Next in excellence to gold he would place Lawrence's amalgam. One difficulty in using Wood's alloy seems to be its tendency to follow the instrument when hot. Plaster it never so carefully against the walls, and the next application of the instrument may make it a little too hot, and the adaptation imperfect. On a large majority of the teeth filled with this alloy will be found yellow deposits of the sulphide of cadmium.

J. C. Robbins had noticed the difficulties and results with Wood's alloy mentioned by the speaker preceding. He believed, however, that with requisite skill and carefulness, the difficulties of manipulation may be overcome. It should be inserted in small pieces, and much pains taken. Had used less of it than he would have done had he been better pleased with the course of the patentee. As a general rule, he preferred amalgam, and thought it would do equally well. Has seen plugs of lead which had done duty for twenty years.

A. C. Castle, M.D., thought Wood's patent invalid, but that is of little consequence, as the alloy is devoid of merit for filling teeth. He claimed that in scrofulous habits, where light-colored caries is making rapid advance, tin foil has a better preservative effect than gold.

C. E. Latimer, D.D.S., had used Wood's alloy for two or three years, and finds it a valuable material. Could employ amalgam with less labor and skill. For some cases the alloy is inadmissible on account of inability to employ the plastering motion essential in its manipulation. The mason with his trowel can instruct us in reference to using this alloy. He had not seen any failures in plugs made of it. Much skill and great care are necessary in its use. It cannot be *pushed* to its place with a direct thrust, but must be carried there by a sweeping motion. Had not noticed cavities in the body of the plug where care had been taken in its insertion. It does not discolor the teeth as amalgam does.

B. W. Franklin claimed that there is no mercury in Wood's alloy. The opposition to patents, nor even the wrong policy pursued by the patentee, should influence our judgment of the alloy itself; that should stand or fall upon its own merit.

J. S. Latimer, D.D.S., had used Wood's alloy for some three years. Found many cases in which he could not employ it for want of room. For such, preferred Lawrence's amalgam next to gold. Had not seen bad results follow the deposit of sulphide of cadmium spoken of. Had seen failures with both amalgam and the fusible alloy in his own practice. He believed, however, that with the alloy the want of success was mainly due to defective manipulation. Concerning the crystal gold which had "chopped," spoken of by one of the gentlemen, he would record his con-

viction that the gold was damp when inserted, or a little saliva remained in the cavity. He had noticed this effect in his own practice with both foil and crystal.

T. H. Burras, M.D., experimented with fusible alloys thirty years ago. He did not think any fusible alloy would be found preferable to amalgam. Some amalgam fillings he inserted twenty-seven years ago are good yet. Had seen a tin foil plug which had done service for forty years. Has gold fillings in his own mouth which have been in thirty years.

G. F. Schaffer said a dental friend had recommended to him lead foil as a temporary plug in sensitive teeth.

C. P. Fitch, M.D., had been using Kearsing's shredded gold, and liked it. It makes a very dense plug which finishes nicely. Any preparation of gold will tarnish under some circumstances, and from causes entirely external to itself.

I. W. Lyon filled a tooth with shredded gold and it came back in a week with the surface discolored. He polished, and it returned in another week black as before. The patient was pregnant, and the usual gastric difficulties were suffered.

At a later meeting (April 11th).

C. E. Latimer, D.D.S., exhibited some Swiss broaches wound with foil, which he uses in filling dental canals. He explained the manner of using them and their advantages. After using the broach until the barbs are dulled too much to serve again for that purpose, he smooths down the barbs and winds foil upon it to suit the size and length of the canal to be filled. The shaft is then cut off at the right length, and the wound part carried to its place with pliers and any suitable blunt point. Thinks he can do better with these than with any other method he has tried.

C. D. Allen (son of John Allen) read a paper on *Keeping Cavities Dry*, the subject of the evening.*

C. E. Latimer, D.D.S., finds he *can* employ the rubber-dam on *all* the teeth. He uses pieces only about two inches square, folds together on the buccal side (if he is filling an inferior molar), and holds it in this funnel shape with his thumb and forefinger. Though the tartar should sometimes be removed from the neck of the tooth to enable the rubber to form a water-tight joint with the tooth, yet in other cases it will assist in holding the rubber to its place. Occasionally a ring (section of rubber tubing) may be placed upon the crown, after the rubber-dam has been placed to keep it down. For drying the cavity prefers pellets of soft muslin or linen, old, free from grease and starch.

His napkins are only pieces of muslin about two inches square, and he often fills lower molars without napkins at all, using his thumb and forefinger to keep the tongue and cheek away. Large napkins discomfort

* See page 620.

the patient, and thus increase the flow of saliva. He charges the patient not to breathe through the mouth.

He had been unable to use to advantage the various tongue and napkin holders he had tried.

Geo. H. Perine had employed with success this device: When about to fill a tooth in a moist mouth, he sometimes gives the patient a saucer, with the injunction to hold it under the chin and catch the falling saliva. This diverts the attention from the operation, and comparatively little saliva is secreted.

J. W. Clowes thanks the Lord for Barnum's rubber-dam. He can use it everywhere, and it is a great comfort to him when he has the arch-enemy, saliva, to contend with.

W. B. Hurd finds the rubber-dam useful in many cases, but he is not able to apply it in all. He has been unable to adapt it to two or three teeth at once.

T. H. Burras uses very small napkins, and sometimes fills without any. Has known submarine operations to do good service.

J. S. Latimer, D.D.S., described his manner of making holes in the rubber. They should be round. If there are any angles, a rent is too frequently the result.

The rubber may be held in its place upon the tooth by waxing a piece of floss silk about eighteen inches in length, tying the two ends together, placing it over the teeth inclosed by the rubber, and letting the patient hold it down with his thumb in the pendent portion of silk. For economy's sake, it is well to know how to repair the rubber. A little cement, made by dissolving some caoutchouc in spirits of turpentine by the aid of heat, or a solution of the gum in bisulphide of carbon, is placed upon the small piece with which the rent is to be covered and kept in position by pressure. (A better method, I have since learned, is to heat the surface of the smaller portion with a piece of hot metal, and then, placing the patch in position, sticky side down, apply a little pressure, and lay aside a few days to harden.) He also exhibited some duct-compressors for preventing the secretion of the parotid glands from entering the mouth.

N. W. Kingsley likes the rubber-dam. He makes the holes in the sheet rubber with punch forceps. His forceps are nicely adjusted, and cut a round hole. Has not been able to apply the rubber in cases like the following: The inferior second bicuspid, with a large posterior cavity extending beneath the gum; the adjoining first molar gone, and much absorption of gum and alveola in consequence; gum firm, and extending well up on the anterior approximal surface. Applied in such a case, the edge of the rubber draws across the cavity some distance above its cervical wall.

I. W. Lyon has found that he can melt a round hole through the sheet rubber with an old excavator or drill, heated nearly to a red heat. The

rubber melts around the hole and forms an adhesive substance which assists in retaining the dam in the desired position on the tooth or teeth.

He overcomes the difficulty mentioned by the preceding speaker, when any teeth remain on that side posterior to the tooth he desires to fill, by cutting a stick of the right length to permit one end to press against that posterior tooth and the other against the tooth to be filled. The ends are cut concave to prevent displacement; the rubber being placed upon the tooth, one end of the stick is used to press the rubber up (or down, on the lower jaw) beyond the cervical wall. The other end of the stick is wedged tightly against the posterior tooth, and so held in position. The wood being trimmed away from the cavity with a burr, we may commence filling at once.

B. W. Franklin presented a new method of loading vulcanite plates for the inferior maxillæ with block tin, which is afterward entirely inclosed within the rubber.

A. W. Sprague, of Boston, by invitation, made some remarks upon the preparation and use of nitrous oxide. He claimed that to have its proper effect, nitrous oxide should be made with great care, the heat not being raised higher than 350° to 410° F. He said that allotropic changes are effected in the gas, as in phosphorus and some other substances, by heat. To this he imputed the better effect of gas made at a lower heat than that too frequently employed.

He had seen it made at a high heat, coming over like so much smoke, and this he had seen administered within a few minutes after, with anything but the best effects of nitrous oxide. He employs an automatic regulator of the heat.

MERRIMACK VALLEY DENTAL ASSOCIATION.

BY G. A. GERRY, SECRETARY, LOWELL, MASS.

THE regular semi-annual meeting of this Association was held in Lowell, Mass., on Thursday and Friday, May 3d and 4th.

The meeting opened at half-past 10 o'clock on Thursday, the President, Dr. A. Lawrence, in the chair.

After the usual preliminary business, the following gentlemen were proposed and elected active members of the Association, viz.: Drs. D. B. Ingalls, of Clinton, Mass.; G. W. Lawrence and G. A. W. Vinal, of Lowell; C. T. Lang, of Woburn; T. G. Durkee, of Stoneham; Thos. Palmer and F. C. Gill, of Fitchburg.

Honorary members.—Prof. J. H. McQuillen and T. L. Buckingham, of Philadelphia; Drs. L. D. Shepard, Salem, Mass.; James McManus, Hartford, Conn.; Elias Strong and John T. Metcalf, New Haven, Conn.

A communication was received from Prof. Buckingham, presenting to the Association a copy of the *Dental Times*, from the commencement

of its publication, along with a number of copies of the April number, 1866, of that magazine. The thanks of the society were returned for the same.

On motion, the chair appointed Drs. Kidder, Little, and Locke, to prepare resolutions on Dental Pupilage, who subsequently reported the following, which were adopted :

The Merrimack Valley Dental Association, being desirous of expressing its gratitude to the dental colleges for their exertions in advancing the cause of dental education, would therefore adopt the following resolutions :

Resolved, That this Association perceives in the high standard which the dental colleges of the United States have marked out for instruction an earnest desire to win for our profession a place in the front ranks of the lovers of science.

Resolved, That we individually recognize it to be our duty to earnestly advise all who are seeking to enter our profession to pursue a regular course of study in some dental college, in connection with private instruction.

Resolved, That we look forward to an early day when a graduation at some dental college shall be made one of the requirements of the younger members of our profession for becoming candidates for membership in this Association.

The following gentlemen were elected delegates to attend the meeting of the AMERICAN DENTAL ASSOCIATION, to be held in Boston, in July, viz.:

Drs. J. W. Kidder, L. F. Locke, D. K. Boutelle, J. Fisk, A. T. Johnson, G. W. Lawrence, D. T. Porter, Chester Heath.

Dr. A. Lawrence then read a paper upon CONSERVATIVE DENTISTRY.*

In the afternoon the subject announced for discussion, Conservative Dentistry, was taken up and opened by the reading of an able paper by Dr. Jas. McManus, of Hartford.* The question was then discussed by Prof. McQuillen, Drs. Metcalf, A. Lawrence and S. Lawrence, Palmer, Cummings, Kidder, and others.

On invitation of the dental profession of Lowell, the convention adjourned at 6 o'clock to partake of a collation provided for them at French's Saloon.

At 8 o'clock an oral lecture was delivered by Prof. McQuillen before the members of the Association, the medical profession, and public, on the HAND AND ARM OF MAN.† The lecture was illustrated by the skulls and extremities of man and animals, among which was a wet preparation of the finely dissected arm of a well-developed man, in which the action and play of the different muscles of the arm and hand were readily observed.

* See page 629.

† The paper of DR. McMANUS and the lecture on the ARM AND HAND will appear in a subsequent number.

The Association met at half-past 8 o'clock on Friday morning. The exercises of the morning consisted of Clinical Instruction, by Prof. McQuillen, during which he filled an incisor for one of the members with sponge gold by hand pressure; this was followed by the explanation of an apparatus and the manner of making and using nitrous oxide, by Dr. Locke, of Nashua, after which the subject of filling teeth and treating exposed pulp was taken up and discussed at length, by Drs. Wetherbee, Salmon, Palmer, and others.

In the afternoon the discussion was continued; and Prof. McQuillen exhibited sections of teeth and bone under the microscope, and Dr. B. Ward Richardson's apparatus for producing local anæsthesia.

It was decided to hold the next meeting of the Association at Lowell, and Drs. Willard and Locke were appointed essayists.

After votes of thanks to Prof. McQuillen for his lecture and demonstrations; to others of the profession not members of the Association for their attendance; and to the profession in Lowell for the collation provided, the Association adjourned.

AMERICAN DENTAL ASSOCIATION.

THE sixth annual meeting of the American Dental Association will be held in the Representatives' Hall, State House, Boston, Mass., commencing Tuesday, July 31st, 1866, at ten o'clock A.M.

Arrangements have been made with the proprietors of the Revere and Tremont Houses to give extra accommodations to the members to the number of one hundred and seventy-five or two hundred. Those desiring to engage rooms in advance can do so by addressing the undersigned, stating the style of rooms, single or double, with expected time of arrival. In this way parties can arrange to be near one another. These houses are first-class and central.

Some embarrassment has been experienced at previous meetings by delegates coming without credentials. To simplify and expedite this matter, the Committee on Credentials recommend that each delegate be provided with a certificate to that effect, signed by the president and secretary of his society, or one of them.

No special invitations to operate at the clinic have been given, but those willing to operate are requested to come prepared, as ample opportunities will be afforded. It is intended to have twenty or more chairs for the purpose.

The profession in Boston and New England will give the Association a hearty welcome. Let us have a full attendance.

L. D. SHEPARD, Salem, Mass.,
Corresponding Secretary.

MASSACHUSETTS DENTAL SOCIETY.

BY L. D. SHEPARD, D.D.S., SEC. PRO TEM.

A SPECIAL meeting of the above Society was held in Boston on the evening of May 2d, to listen to a lecture by Prof. McQuillen, of Philadelphia, whom the Society had invited to address them.

There was a large attendance of the profession, with ladies and invited friends, including physicians.

"THE COMPARATIVE ANATOMY OF THE TEETH" was the subject of the lecture,* which was delivered without notes, and illustrated by a large collection of skulls, ranging from the lowest CLASS of the VERTEBRATA to the highest form, as found in man, demonstrating in a clear and satisfactory manner the dental apparatus of fishes, reptiles, and mammals; after the lecture, sections of the teeth of different animals were shown under an excellent microscope.

A vote of thanks to Dr. McQ., for his interesting and instructive address, was passed, and on motion of Dr. Wetherbee, the Society decided to present him its diploma of Honorary Membership.

We must commend the practice adopted by some societies of inviting eminent men of the profession to meet with them from time to time. Many cannot avail themselves of the advantages of the colleges, while most who have enjoyed their instruction need refreshing. The value of such meetings cannot be computed.

CENTRAL MASSACHUSETTS DENTAL ASSOCIATION.

BY J. N. TOURTELLOTTE, M.D., SECRETARY, WORCESTER.

ON Tuesday evening, May the 1st, by invitation of the CENTRAL MASSACHUSETTS DENTAL ASSOCIATION, its members and those of the NATURAL HISTORY SOCIETY, and the public were favored with a scientific lecture in WASHBURN HALL, Worcester, by Prof. McQuillen, on the "CUVIERIAN CLASSIFICATION OF ANIMATED NATURE."†

We were highly gratified with the easy method of presenting a subject usually regarded dry and uninteresting to the general community, though of incalculable importance to the naturalist and scholar.

The lecture, an extemporaneous one, was fully illustrated with a rare and valuable collection of specimens, from the lowest to the highest order of animals, some of which had been loaned by the NATURAL HISTORY SOCIETY OF WORCESTER.

The lecture was well received, and held the undivided attention of the entire audience throughout, for an hour and a half. At the close, a hearty vote of thanks was tendered by the audience to the speaker for his able and eloquent lecture.

* This lecture will be presented in a subsequent number.

† See page 642.

AMERICAN DENTAL CONVENTION.

THE twelfth annual session of the American Dental Convention will be held at New York on Tuesday, August 7th, 1866, at ten o'clock A.M. All members of the dental profession are invited to attend.

L. BUFFETT, Cleaveland, O.,
Corresponding Secretary.

CENTRAL STATES DENTAL ASSOCIATION.

THE third annual meeting of the Central States Dental Association will be held in the lecture-room of the Kentucky School of Medicine, in the City of Louisville, commencing on Tuesday, July the 17th, 1866, at 10 o'clock A.M.

W. H. SHADOAN, *Secretary.*

CORRESPONDENCE.

CORRECTION.

NEW YORK, May 16th, 1866.

DR. J. H. MCQUILLEN.

Dear Sir,—Will you oblige me by correcting the report of "Discussions of the Society of Dental Surgeons of the City of New York," vol. vii. p. 540, No. 10, May, 1866, DENTAL COSMOS? Having withdrawn myself from this society, I have not the opportunity to show the error before its members, but rather seek to adapt the *printed* report before the public, to the view from which I based my remarks. The report says, "He" (Dr. Castle) "'claimed' (!) that a German chemist 'found' in the solid constituents of the blood, milk, saliva, serum, muscle, and bone; 'about' 28 per cent. of 'lime,' and 'some' 5 per cent of phosphate of lime." Contradistinguished from all this, among my diffused remarks, I said that "we know very little in relation to the physiological elaboration and development of the organic nutritive animalization of the tissues of the animal system, more especially of the dental tissues, derived from food or medicines, no more than we know of organic vegetable nutrition derived from the earth and elaborating and developing the variety in the vegetable kingdom." Dr. Fitch said he "knew the process of nutrition." I continued: "I speak of my *own* knowledge. I know that we eat food, and that it is converted into *chyle* and *chyme*; that this is conveyed into the circulation; but how it is metamorphosed into the several tissues and fluids of the animal system I was free to say we absolutely know nothing. The beautiful theories of writers, based upon logical and inferential deductions in the absence of demonstrable facts, we were compelled to accept as truths, because we have no real data to start from to disprove

them. Nutrition depended upon the perfect normal condition of the whole animal organization; that the several constitutions or habits of body absorbed the nutrition most suitable to the peculiar individual organization representing the several temperaments, diatheses, physical education (negative or active), climate, which influenced the constitutional varieties of the great human family. That it was of little consequence what food people received, provided they were sufficiently supplied, as both the animal and the vegetable kingdoms offered all the phosphates necessary to the organization of nutrition, provided the animal system is in the normal condition to avail itself of the nutritive particles offering themselves for the nutrition of the body—of course the dental organs included; that it was a curious fact, which was well known to the physiologist, that the composition of the fluids of the body does not differ *essentially* from the solids; there we find the same immediate principles and the same elements, which I attempted to illustrate and demonstrate upon the black-board, under the headings of blood, milk, saliva, mucus, serum, muscle, and bone. I placed the figures, 28, for phosphate of lime, and 5, for phosphate of soda, as the proportion of these phosphates in each 100 parts of the solid residuum, as representing, merely, the approximation of the constituent bases of the elementary base of each to the others, and that these phosphates were so organized in the fluids and tissues of the animal system whether the animal was fed on animal or vegetable diet, in accordance with the peculiar constitutional diathesis of each individual or family. Chemists told us the basis of the diamond was *carbon*; but they failed to inform us what constituted the vitalization—if you please—or *metamorphosis of the carbon* to render it into the crystal brilliancy of the diamond. Now what crystallization is to the carbon, so animalization metamorphoses organized nutrition into the animal tissues and the animal fluids making up the animal system.”

Dr. C. E. Latimer, evidently doubting the illustration on the black-board, demanded “Whether I had made the chemical analysis of these fluids and tissues?” referred to.

I replied, “I had not; that I made no pretension to a knowledge of chemical science to enable me to do so.”

“Where do you derive your information then?” demanded the doctor.

“From the works of the great authors on chemical science and research.”

“Name them!” rejoined the doctor.

I replied, “just now I cannot do so, my memory for placing names in their proper places is bad. I will, however, mention generally Berzelius, Wollaston, M. le Canu, Enlin, Lavoisier.”

Very respectfully,

A. C. CASTLE, M.D.

PERISCOPE OF MEDICAL AND GENERAL SCIENCE IN THEIR RELATIONS TO DENTISTRY.

BY GEO. J. ZIEGLER, M.D.

"The Relations of the Periosteum to Osteogenesis. By E. S. GAILLARD, M.D., Richmond, Va.—In the practice and literature of surgery, no fallacy is, apparently, more frequently accepted as truth, than that the periosteum is necessary to osteogenesis; that it is indispensable for the vitality and reparation of bone.

"By many of our most respectable authorities, both in the library and in the lecture room, such doctrine is, however, taught, and we are told, that where bone is deprived of its periosteum, it must die; that in such an event, it is the part of good surgery to anticipate nature in its removal.

"It is not unusual, at operating tables, to witness the removal of fragments of bone, which, though stripped of their periosteal investment, have yet their histologic connection with the medullary structure uninjured; to see the chain-saw and bone-pliers applied to the extremities of bone which had been only denuded of their periosteum.

"If it can be demonstrated that the fragments thus removed would have soon co-operated in re-establishing osseous integrity, and that the ends of bones so mutilated would have soon been re-covered with periosteum and restored by nature to their normal condition, it is evident that much of the surgical interference, now so frequently instituted, would be justly condemned as injurious and unnecessary.

"As in the animal economy 'the blood is the life thereof,' of course neither the original formation of bone nor its reparation can ever occur without a physiologically complete circulation; if any tissue be deprived of its blood, either by obstruction of the circulation, or as the result of violence, it must die.

"The death of bone, when denuded of its periosteum, is attributed to this ostensible cause—that bone, for its growth, vitality, and reparation, is dependent upon the blood obtained through the vessels of the periosteum. Is this a physiological truth?

"It is of course known to every tyro in anatomy, that the arteries distributed to the bones are usually divided into three classes.

"The first class is that which is supplied from the periosteum; these vessels are small in character and indefinite in number, penetrating the cancellated structure of the bone and inosculating, by their radicles, with the capillaries of the first and second class.

"The arteries of the second class penetrate directly, by foramina, the extremities of the long bones; in other bones they enter at no common point, but irregularly.

"The third class consists of the medullary artery, penetrating, by its proper foramen, near the centre of the bone.

"The arteries of the first two classes are generally extremely small, and ramify upon the compact and cellular structure, penetrating it in every direction and anastomose with the radicles of the nutrient (medullary) artery.'

"It is thus evident that the radicles of the medullary artery freely anastomose, as well with the capillaries of the arteries penetrating the ends

of the bones, as with those of the arteries derived from the periosteum, and that, in the event of denudation of the periosteum, the cancellated structure of the bone is fully supplied with blood from the anastomosis existing between the radicles of the medullary artery and the capillaries of the arteries penetrating the bones at their ends; or, as may be more clearly, and now more briefly stated, the cancellated structure of the bone is, for its vitality and reparation, independent of the supply of blood derived from the arteries of the periosteum.

"These facts are known to every careful anatomist; the only subject of uncertainty being as to the completeness of this capillary inosculation and its supplemental adequacy for sustaining thoroughly the vitality of the cancellated structure, when the periosteal vessels have been ruptured. That this anastomosis is entirely sufficient for the objects to be accomplished, may now be admitted as one of the facts and demonstrations of surgery.

"Mr. Cooper was of the opinion 'that the external and internal periosteum bear strict resemblance to the cellular neurilemma of a nerve, to the membranous covering of the sarcolemma of a muscle, and to the parenchyma of the various viscera; each being for the same purpose—that of forming a nidus or basement membrane for the products eliminated from the blood.' He also states that the importance of the medullary circulation in the formation of bone 'may be proved by destroying the medullary membrane in the bone of a living animal, when the inflammation which is consequently set up extends to the EXTERNAL periosteum;' showing, thus, the intimate connection existing, not only between the medullary membrane and the periosteum, but between the medullary membrane and the cancellated structure, which is, of course, the medium of communication.

"Attention is called to the fact that, in the opinion of this great anatomist and surgeon, the medullary membrane is just as much, functionally and physiologically, a periosteum as that external investing membrane which we are in the habit of exclusively calling by this name.

"It is an important fact that Flourens, in his experiments with madder for determining the mode of histologic nutrition, observed that the coloring of the bone was manifest throughout its entire extent, though the coloring matter was first deposited or manifested immediately under the external periosteum. The results of these experiments only serve to confirm and establish facts first demonstrated by Hales, Duhamel, John Hunter, Tomes, and others. Tomes, indeed, mentions the interesting fact that, in the growth of bone, 'the sides of the shaft in particular acquire great solidity by the narrowing of the Haversian canals, within which the vascular membrane goes on depositing fresh layers of bone, and madder administered while this process is going on, colors the interior and recently formed laminæ so that, in a cross section, the Haversian apertures appear surrounded with a red ring.'

"It is thus proved that the deposit of bone, as manifested by the coloring matter indicated, is not exclusively centripetal in action (showing thus a preponderance of the periosteal circulation), but that such deposit occurs internally as well as externally—from the 'vessels of the vascular membrane' as well as from the external periosteum. *It is therefore proved that bone derives its vitality and nutrition as well from the medullary circulation as from the vessels of the periosteum, and that it is illogical and unphysiological to assume, because one of the classes of blood-vessels engaged in osteogenesis is injured, that bone may not both*

be formed and nourished from that other and co-ordinate class which remains uninjured.

"Craigil, in his elements of general and pathological anatomy, distinctly states that, 'though the periosteal vessels are the main agents of ossification *originally*, there is reason to believe that the medullary vessels contribute to its growth and nutrition after it is formed.'

"Collateral evidence tending to prove that the periosteal investment is not essential to the production of bone, may be obtained from the phenomena of intra-uterine osteogeny.

"Many large and important muscles are, by extensive surfaces, attached directly to the bone, no periosteum intervening and there being no evidence of its ever having intervened or been instrumental in the formation of such portions of these bones. Such facts may be observed in the attachments of the quadriceps femoris, pectoralis major, deltoid, the latissimus dorsi, glutæi, triceps, gastrocnemii, etc.; also in the attachments of many ligaments—ligamentum patellæ, ilio-sacral, interosseous ligaments, and the ligamenta subflava.

"It is thus evident that, in intra-uterine life, bone is manifestly formed where the periosteum does not exist, and that it is independent of the periosteal vessels for its vitality and growth.

"Though the medullary membrane has not been satisfactorily proved to exist in fœtal life, it is from the vessels forming subsequently the basis of this membrane that bone is developed and supported where the periosteum is absent.

"Is bone in extra-uterine life equally independent of the periosteum, in the event of injury or violence sustained by this membrane?

"In a recent work on histology, it is asserted 'that the question whether plasma, from which the new osseous tissue is developed, is exuded by the periosteum or by other parts, is not as important as some authors seem to have held. Obviously it makes no difference whether it be poured out by the vessels of the periosteum alone or not. Whence-soever derived, however, it can be organized into bone while in contact with bone. Hence the importance of leaving all the spiculæ of bone as centres of ossification, provided they are not so detached as to act as foreign bodies.'

"As satisfactory as is this evidence of the independence of bones (in their reparation) in regard to their periosteal investment, the testimony of Dr. Horner is still more complete.

"This writer states that 'some physiologists have attempted to give to the periosteum the exclusive credit of the formation of callus. This view is erroneous, because experiments show that even when the periosteum is stripped designedly from the fractured ends of bones, they nevertheless unite, and the periosteum is restored when the callus is formed.' This testimony is particularly satisfactory, for it not only proves that bones denuded of their periosteum will unite independently of their periosteum, but that the periosteum is only redeveloped *after* callus has been formed, and is consequently *not the agent of reparation*.

"In a lecture on conservative surgery, delivered at the Royal College of Surgeons, June, 1864, by Mr. William Ferguson, F.R.C.S., F.R.S., Professor of Surgery at this college, the following testimony is given. The high position which this gentleman justly fills, entitles his opinions to entire respect and confidence: 'I believe it to be a common opinion, that when a piece of bone is bare or a joint grates there is no probability of

recovery in the part, and that amputation is the proper course. *This, however, is a great error*, for bare bone is covered again, in many instances, and a joint may be still so far restored that there may be a certain amount of motion in it. Even when bone is dead, nature causes a separation and thus leads the way to its removal, etc.'

"As facts are, however, by the practical surgeon, more highly esteemed than opinions and deductions, however plausible, a report of two interesting and illustrative cases is herewith submitted.

"The first case occurred at the General Hospital, at Charlottesville, Va., in charge, at the time, of Dr. J. L. Cabell, through whom this report was originally obtained. The patient was immediately treated by Dr. F. L. Bronaugh, in charge of the ward, and subject, throughout the history of the case, to the supervision of Dr. J. S. Davis, in charge, at the time, of the division.

"Drs. Cabell and Davis (in connection with Dr. Bronaugh) watched this case with interest and care, and there was, on their part, an entire unanimity relative to the opinions stated in the report.

"The history of the case proves that, under the most unpromising circumstances, the ends of bone denuded of periosteum will unite, and it is, so far as known, the only case occurring during the recent war which clearly illustrates and proves such a fact.

"Case A.—'Sergeant W. G. P. was wounded at the Wilderness, May 6th, 1864, and was received at this hospital May 12th; age, 20; previous health good; by occupation a farmer. The ball, presumed to be a conical leaden bullet, penetrated the right buttock, four inches posterior to the trochanter major, and, passing obliquely forward and downward, emerged at a point two inches in front and one inch below the trochanter. When admitted, the patient complained of great pain, was restless, desponding and feverish, with total want of appetite. The decubitus was left lateral, with right hip elevated and thrown forward. The daily arrival of a large number of cases demanding immediate attention, precluded the possibility of a very careful examination of this case, until the 17th of May, at which time the patient was suffering from irritative fever in an alarming degree. A hard tumor was felt just below the inferior limits of the trochanter, on the outer aspect of the limb; it was supposed to be due to a displaced and separate fragment of bone. The patient was placed under the influence of chloroform and an incision made over the tumor, when it was ascertained that it was caused by the abduction (with flexion) of the upper fragment. The wound being explored with the finger, it was found that there was oblique fracture, without comminution, of the upper part of the shaft, and that the anterior aspect of the upper fragment *was stripped of its periosteum for two inches, viz.: to the point of insertion of the capsular ligament.* The case was so very unpromising that the question of the application of Smith's anterior splint was discussed, more with a view to affording some temporary relief to the sufferer than with any hope of ultimate success.

"The splint was applied on the 18th instant, and with the effect of giving immediate relief to the patient. The impossibility of overcoming the extreme abduction of the upper fragment, rendered it necessary to place the entire limb in a line of direction corresponding with that of the upper fragment. His improvement was marked in a few days. The inflammatory tumefaction underwent a rapid abatement; the fever subsided, and the appetite returned. No complication supervened. On the 28th

of July a large sequestrum was removed in several pieces. It represented a scale of bone from the anterior aspect of the upper fragment, and doubtless corresponded to the denuded portion above referred to. The splint had been removed on the 19th of July. He remained in bed until September 1st, when he made his first experiment, by walking, with the aid of crutches. His limb was shortened about two inches.'

"On making further inquiry in regard to this case, it has been ascertained that this young man is now independent of his crutches and is in excellent health.

"It will be evident, on reading the facts narrated in the next case, that the detachment of the sequestrum of bone in case A was not due to a stripping of the periosteum, but to a further action of the violence that caused the original fracture—that the force of the blow was expended as well upon the cancellated structure as upon the periosteum; for were the detachment of the sequestrum due alone to a denudation of the periosteum (and not also to violence inflicted upon the bone itself), there would have been, not the separation of a mere lamina of bone, but the injury would have extended through to the medullary structure. The force of this demonstration, however, will be more important when seeing, as in case B, that after the removal of the periosteum entire, without the infliction of other violence upon the bone, *there was no sequestrum detached, but, on the contrary, that the entire periosteal investment was re-formed.*

"The second case was kindly sent to me by Dr. Le Grand Capers, well known as a physician of close observation and uniform efficiency.

"Case B.—'This case was one in which the entire scalp (integuments and pericranium) was forcibly removed, from the frontal protuberance, around over the ears and across the superior semicircular ridge of the occiput by that barbarous process termed "scalping." The bone thus denuded was felt by the officers in charge and by numerous officers of the garrison, as well as by myself. Over this extensive surface, granulations soon formed, and, in less than four weeks, the entire bones were covered and protected by a thick, fleshy, granulating surface, covering every vestige of bony matter, and *this without either exfoliation or necrosis.* This rapid repair of the periosteal investment is still more remarkable, from the fact that the patient, a Mexican boy of eighteen years of age, having been left as dead by the Indians, was alone, sixty miles from the nearest fort, "Phantom Hill," and was several days in making this journey; the parts, during the interval, being exposed to the sun, night air, and the dust of the road. From these causes, several days intervened before he received the slightest attention. *The granulations were completely covered with cuticle by the sixth week, after which he experienced not the slightest inconvenience from the injury to the scalp, the pericranium having been completely restored and the vitality of the denuded cranial bones not having been in any respect impaired.*'

"This case is submitted without any comment whatever. It tells its own story.

"The importance of the periosteum is of course great, but it is often, if not always, overestimated.

"Dr. Toland, of California, first brought to the attention of the profession (in 1854) the fact that the phalanges of the fingers would be re-formed if the periosteum be preserved. This truth has been demonstrated in regard to other bones, and Dr. Peaslee, in his Histology, states that the

maxilla inferior, the costæ, the scapula, and the clavicle have all been removed under these conditions. M. Maisonneuve has removed the tibia, with the same result. Heine states that a rudimentary bone has been formed when the entire periosteum, as well as the bone, has been removed. It must be confessed, however, that this statement is to be regarded as a tentative appeal to the credulity of the profession.

"Since the publication of these cases, showing that entire bones may be re-formed if the periosteum be preserved, the importance of this membrane has been more than ever exaggerated, and the assumption has been almost unconsciously made, that if necessary to the regeneration of an entire bone, it is equally necessary for the reparation of a part of it.

"To sum up all that has been stated in this connection, it is evident that the prognosis which usually takes place where bones are denuded of their periosteum, is not justified or warranted by recorded facts; that there is no physiological reason for assuming that denuded bone will die, but, on the contrary, that it will usually be re-covered with its periosteum, and restored to its normal condition.

"If this important truth be recognized, surgical interference in all cases of denuded bone will be abandoned, and one step secured in the progress of conservative surgery."—(*Richmond Med. Jour.*)

"*Deformity of the Lower Lip and Chin from the Cicatrix of a Chancre, which had been treated with Caustics for its Removal; Rynd's Operation.* (Meath Hospital and County Dublin Infirmary. Cases under the care of Mr. PORTER, Senior Surgeon to the Hospital. Reported by Arthur Wynne Foot, M.D.)—James Ryan, 34 years of age, was operated on with a view to rectify a great disfigurement of his appearance from the loss of his lower lip and exposure of his teeth and gums, and to prevent the constant loss of saliva and of food during mastication, from his mouth.

"The operation devised by Mr. Rynd, and described by him in the thirty-second vol. of the *Dublin Quarterly Journal*, was performed. A knife was passed through the mucous membrane of the lower lip from one canine tooth to the other; a second incision separated all the soft parts of the chin from the body of the bone as far down as its lower margin. The chin, now movable from having been loosened from its attachments to the bone, was drawn upward by strips of adhesive plaster brought from under the chin and made to adhere to the zygoma on either side. The operation, which was performed exactly in the manner indicated by Mr. Rynd, resulted in the approximation of the new lower lip to the upper one and the consequent closure of the mouth, which obviated the distressing effects of the destruction of his original lip."—(*Dublin Medical Press and Circular.*)

"*Necrosis of Jaw-bone.*—At a recent meeting of the Surgical Society of Ireland, Dr. Grimshaw exhibited an interesting specimen of necrosed upper jaw-bone, from a child of five years old. The child had suffered from a severe attack of fever, after which the portion of bone containing the two temporary molars and alveolus of the canine of the right side, with the rudiments of two permanent teeth, was exfoliated. The case was of interest from the rarity of the occurrence after fever."—(*Med. and Surg. Reporter.*)

Dislocation of Jaw.—"Dislocations of the jaw from muscular action, as in yawning, laughing, etc., M. Guinier, of Montpellier, observes, are not infrequent; but he believes that he is the first to record an instance in which the accident has been produced during laryngoscopic exploration. In order that the mirror may give an efficient and complete reflection of all the accessible portions of the vocal apparatus, the patient must be in an active state, and, by a co-ordinate exertion of muscular movements, endeavor to afford as large a display of the vestibular orifice of the larynx as possible. Flattening the base of his tongue, or maintaining it out of the mouth by the fixation of its extremity, and especially lowering, and, at the same time, advancing the lower jaw—such is the combined procedure most favorable for laryngoscopic examination. This movement, which is entirely voluntary, becomes in some measure automatic, and is sometimes effected with a certain degree of energy by persons habituated to the laryngoscope and very desirous of obtaining the benefit of its employment. The carrying the jaw downward and forward, either gradually or suddenly in an exaggerated manner, may give rise to its dislocation, especially in some women whose articulations are very loose, and in whom the articular ligaments bear a certain amount of distention.

"The case which gave rise to these observations was that of a phthisical woman, 38 years of age, suffering from chronic ulcers of the larynx, and in whom complete dislocation forward was twice produced at intervals of a month, while cauterization was being applied by means of the laryngoscope. It was easily reduced by pressure with the thumbs on the last lower molars, and drawing forward the ascending ramus embraced by three fingers of each hand. The accident may easily be prevented by cautioning the patient to moderate his co-operation, so as not to effect with too great energy the double movement of depressing and advancing the lower jaw. An excess of action in the external pterygoid muscle seems to be the chief agent in effecting the dislocation. With even a moderate separation of the jaws, such as is requisite for the employment of the mirror, the condyle of the jaw is already carried forward; and the external pterygoid, then brought into action, exerts strong traction on the condyle, so that in predisposed persons, dislocation may readily take place."—(*Med. Times and Gaz.*)

Anchyllosis of the Lower Jaw. (Pennsylvania Hospital. Surgical Clinic of D. HAYES AGNEW, M.D. Reported by Dr. Napheys.)—"This patient, a girl 10 years of age, states that she received a fall some months since, striking her chin, since which time her jaw has become gradually stiff. She is unable to separate the maxillæ more than will serve to admit the blade of a knife flatwise. She is suffering also from an old tarsal ophthalmia.

"On examining the muscles of mastication, no rigidity can be discovered; the muscles are not at fault, and we may look for the cause, therefore, at the articulation. In all probability, there has been a synovitis, and the immobility due to intersecting bands within the joint. An anæsthetic will be administered, and when under its influence, a dilator will be inserted between the jaws, and the maxillæ gradually and forcibly separated. The blades of this instrument should always be protected with wood or gum elastic, otherwise the teeth may be injured. After the adhesions are broken up, active movement must be kept up every day, to insure the destruction of the false bands, and restore the function of the joint.

"The operation was performed as described, and the diagnosis proved to be correct. This patient, at the end of two weeks, was discharged cured."—(*Med. & Surg. Reporter.*)

"Fracture of Jaw by a Blow from a Ball. By A. B. BANCROFT.—A few days since I was called to see Mr. H. H. B., aged twenty-five years, of more than average muscular development and vigor. He gave me the following account: while crossing Boston Common on his way to the Providence depot, he tarried a moment to witness a game of base ball. Although four rods from the players he was hit in the face with a ball with great force. I found there was bleeding from the gums, dribbling of saliva, and crepitus between the lateral incisor and canine tooth of left side of lower jaw. The displacement was inconsiderable, and the irregularity in the line of the teeth slight. Yet the mobility was quite distinct, proving unequivocally the fracture. The parts were secured in apposition by connecting the sound teeth on each side of the fracture with platinum wire, and by the application of a piece of pasteboard previously softened in hot water, and accurately fitted to the jaw, and retained in position by the four-tailed bandage. The pasteboard I intended as a temporary appliance, meaning to substitute gutta-percha; but the former answered so well that I did not remove it.

"So severe an accident, and produced in the manner it was, would lead us to infer that these balls must be composed of different material from yarn or thread, and that serious injury may not unfrequently result from their too common or careless use. This is especially true if the statement I have heard is correct, that the nucleus or central part of these balls is composed of lead."—(*Boston Med. and Surg. Journ.*)

"On the Rapidity of Absorption after Subcutaneous Injection. By DR. EULENBURG. (*Med.-Chir. Rundschau*, 1865, iv. 960, from *Centralblatt f. d. med. Wiss.*)

"Eulenburg made experiments to determine the rapidity of absorption of substances subcutaneously injected, by their appearance in the parotid saliva, and the secretions of the mouth. He sometimes employed the method of *Eckhard*, obtaining the parotid secretion by introducing tubes into the oral orifice of both Stenonian ducts; at other times he made use of the entire combination of secretions of the mouth. He experimented first with iodide of potassium, and detected it in the saliva, at the soonest after one minute, at the latest after five minutes; and the sooner the nearer to the head the injection was made. The remedy could still be distinctly detected after twelve to thirty-six, very seldom after forty-eight hours. After internal administration it could not be demonstrated until after twenty to forty-five minutes, and the elimination was correspondingly slow after internal use. Sublimate (gr. 1-6 to gr. 1-12) could be detected in the secretions of the mouth within from two to ten minutes after injection. After internal exhibition of an equal dose of sublimate so rapid an absorption was never observed."—(*St. Louis Med. and Surg. Journ.*)

"Syphilis communicated by a Kiss.—At a recent meeting of the Chicago Medical Society, a member related the history of a young woman, whose irreproachable character left no doubt of the truth of her narrative, who experienced the horrors of syphilitic inoculation, through a kiss from

the gentleman to whom she was engaged. A chancre upon the lip was the result of this caress, and subsequent medical investigation revealed the fact that the young man was at the time under treatment for syphilitic ulceration of the throat.

"We have ourselves seen a similar case in which we had reason to believe syphilis was communicated in the same way."—(*Boston Med. and Surg. Journ.*)

"Dr. Richardson's Method of Local Anæsthesia."—Dr. Richardson is still engaged in perfecting his method of producing local anæsthesia, and we shall be able in an early number, we hope, to present from himself an account of the improvements he has been able to introduce. Meanwhile we may report that he has now constructed a very effective multiple instrument composed of three distinct jets, which can be moved to various angles, which can be worked with a single pair of small bellows, and which produces good anæsthesia over a surface of the body three inches long and nearly two wide. He is also, as stated in our last impression, closely investigating the action of various liquids of low boiling point, with a view of ascertaining whether a more efficient agent than ether can be obtained. Up to this time, we understand, ether retains its position, and a singular and unexpected fact has been elicited that, at all events, some fluids which have a lower boiling point than absolute ether (92° F.) do not act as efficiently as ether itself. A very pure hydro-carbon obtained from paraffin (photogene oil), analogous to kerosolene, produces an action next best to ether; but in London it is not easily procurable, and the boiling point of different specimens varies so much that it cannot be relied upon.

"Lastly, Dr. Richardson has been using various applications to the skin preliminary to the distribution of the spray, in order to prevent the smarting which is sometimes complained of, especially when the action is prolonged. For this purpose he has used different liniments—oils, glycerin, narcotic solutions, and tincture of iodine; the tincture of iodine being apparently the best. On the whole, however, nothing succeeds so well as rapid action of the spray; when complete narcotism is produced in six or seven seconds the process is quite painless.

"The reception of the process by the profession is almost without parallel, and its success may be considered as established. Owing to the circumstance that the demand for absolute ether is as yet greater than the supply, some partial failures have occurred, and we would, therefore, specially direct the attention of the profession to the rules on the subject of the ether to be employed, which have already appeared in this journal.

"In concluding this short notice, we may observe that medicine, not less than surgery, receives a new addition to its resources in 'narcotic spray;' the application has proved to be signally serviceable in the local treatment of neuralgia, lumbago, subacute rheumatism, nervous headache, and spinal irritation.

"The question is constantly being put to us—In what operations may the anæsthetic process be used with success? This question can only be answered by experience, but we may state that to our knowledge it has been successfully used in the following operations:—Opening of abscesses and sinuses, removal of tumors, removal of fingers, tooth extraction, removal of the eyeball, dividing tendons, laying open the knee-joint, operation for whitlow, dividing carbuncles, removing piles, phimosis, applica-

tion of nitric acid to ulcerated surfaces, operations for fistula, circular incision round the coccyx, removal of toe nail, and tying a nævus. The process, as we noticed last week, has also been employed by Mr. Spencer Wells with an unexpected degree of success in the great operation of ovariectomy."—(*Med. Times and Gaz.*)

Oil of Ergot in Odontalgia and Hæmorrhage.—"DR. WRIGHT (as quoted by Dunglison's New Remedies (*Journal of Materia Medica*) states that the oil of ergot is one of the most valuable remedies with which he is acquainted in toothache, and has frequently known it subdue the pain when creosote had failed.

"Mr. Wright found the oil of ergot an efficient hæmostatic in bleeding from gums and from leech-bites; and both Arnal and Bonjean used ergotine successfully in every form of spontaneous hæmorrhage."—(STILLÉ.)

"Tooth Cement (Stehle).—Gutta-percha, 5 parts; white wax, 1 part; oil of cloves, a few drops. (*Wittstein's Vierteljahresschrift f. Pharmacie*, p. 2, xiv.) Another (Sorel): a light oxide of zinc is prepared by moistening the ordinary oxide with nitric acid, and then igniting it. Thus prepared, it is made into a soft paste with a solution of chloride of zinc, having a specific gravity 1.9 or 2.0. This soft mass speedily acquires great hardness, which it permanently preserves. If a gray color is required, the least trace of carbon may be used, got by holding the pestle with which the paste is made over the gas for a moment. A trace of sulphide of cadmium will produce a yellow tint."—(*Year-Book of Pharmacy and Dublin Med. Press.*)

Disinfection.—"Classifying roughly, it may be said that there are three general methods of disinfection. In the first place, there are agents which destroy by simple *dédoublement*, or demolition. Heat, for example, may often act in this way, and there are few more convenient methods of purifying infected clothing than the common processes of boiling or baking. Then there are agents which destroy chemically, by oxidation, and it is in this class that most of the approved disinfectants must be included. The ozone producers, such as phosphorus and the permanganates; chlorine, bromine, iodine, and their compounds; nitrous and nitric acids, and the nitrates of the heavy metals, all fall into this category. Charcoal and similar porous substances must be placed in the same list, as has been already stated. Next come the simple antiseptics or arresters of decay. In this list may be placed extreme cold, tannic acid, and various metallic salts, as of mercury, copper, and zinc. The applicability of the members of this class is by no means so general as that of most of the substances previously mentioned, since their field of action is of comparatively limited extent. Several of the chemical agents comprised in this class appear to act simply by combining with organic substances so as to form imputrescible compounds. Finally, some of the most efficient agents of all are those which, like tar and turpentine, act both by virtue of antiseptic and of oxidizing power."—(*The Nation.*)

"Deodorization and Disinfection.—DR. J. H. BARKER, in his prize essay on 'Deodorization and Disinfection,' sums up the results of several series of experiments in the following propositions:

"1. For the sick-room, free ventilation, when it can be secured, together with an even temperature, is all that can be required.

"2. For rapid deodorization and disinfection, chlorine is the most effective agent known.

"3. For steady and continuous effect ozone is the best agent known.

"4. In the absence of ozone, iodine exposed, in the solid form, to the air is the best.

"5. For the deodorization and disinfection of fluid and semi-fluid substances undergoing decomposition, iodine is best (employed in the form of tincture).

"6. For the deodorization and disinfection of solid bodies that cannot be destroyed, a mixture of powdered chloride of zinc, or powdered sulphate of zinc, with sawdust, is best. After this, a mixture of carbolic acid and sawdust ranks next in order; and following on that, wood-ashes.

"7. For the deodorization and disinfection of infected articles of clothing, etc., exposure to heat at 212° Fahr. is the only true method.

"8. For the deodorization and disinfection of substances that may be destroyed, heat to destruction is the true method."—(*Chem. News.*)

"A pleasant Mouth Disinfectant.—A writer in the *Dentist*, Leipsic, 1866, gives the following formula for a corrective of the bad odor from decayed teeth—which he suggests may prove to the dentist cleansing them, and the individual suffering from them, a source of cholera. Formula: Hypermanganate of potassa and hyperoxydate of barium, of each twenty-four grains, one-half to be rubbed up into a mass, with sugar and glycerin, and divided into 144 lozenges. Every ill-smelling mouth will become by their use perfectly odorless."—(*Medical Record and Detroit Med. Rev.*)

"Novel Application of Turpentine as a Fuel.—On the 18th of February, CAPT. SHPACOVSKI, professor at the Paul Military School, exhibited at the Old Admiralty, St. Petersburg, certain applications of combustible fluids, reduced to dust or spray by means of an apparatus which he calls a pulverizer. This process enables the inventor to burn every particle of the fluid; he effects this in a lamp of a peculiar construction. The flame produced by turpentine spray in the apparatus is enormous, and reaches a height of two feet, rushing through the burner with a noise similar to that of steam escaping from a pipe. The color of the flame is a whitish yellow; the temperature is equal to that of molten steel (1,040 deg. Reaumur, equal to 1,300 deg. Centigrade). The quantity of turpentine burnt in the lamp in one hour with the pulverizer is from two to five pounds Russian, which, at three copecks per pound, costs from six to fifteen copecks. Mr. Shpacovski began his experiments by melting a bundle of fine steel wires. This was soon brought to a red heat, and in a few seconds began to melt and then to burn, throwing out sparks. The inventor then applied the flame in a horizontal jet to a piece of copper weighing five zolotniks, which was equally melted (copper melts at about 873 deg. Reaumur, or 1,090 deg. Centigrade). He also exhibited a crucible to melt from five to ten pounds of the same metal. Among other experiments some were made to illustrate the application of the process to the charring of timber used in the construction of ships. The wood was not destroyed, being only carbonized to the depth of 1-120th of an inch. After exhibiting a lamp with four pulverizers, giving a flame of 3½ feet in height, and 4 inches diameter, Mr. Shpacovski de-

scribed his steamboat, the boilers of which are heated by pulverized turpentine. This boat, about 24 feet long by 3 feet beam, with an engine of 2-horse power, runs six knots per hour; her boilers are heated by four pulverizers fed by pipes from a reservoir placed in the bows. The consumption was 3 lbs. per horse power per hour; but Mr. Shpacovski is now building a boat of 6-horse power, with an improved boiler, and expects to reduce the consumption of turpentine to $1\frac{1}{2}$ lb. or 2 lbs. per horse power per hour. He has orders for twenty similar steamboats for St. Petersburg and neighborhood; most of them are intended for the passenger traffic on the canals. It is needless to state that the new fuel is more expensive, weight for weight, than coal; but it is claimed that this will be more than compensated by the saving which will be effected on the quantity consumed by means of the new process."—(*London Engineer and Drug. Circ.*)

Improved Method of producing Intense Heat.—"M. SCHLÆSING has succeeded in discovering an arrangement by which an intense heat, sufficient to melt iron, can be got from ordinary gas. The principle of his contrivance is the complete combustion of the proportionate amounts of gas and air within a confined space, and the continuous supply of the combustible materials. A copper tube, carefully pierced, is the chief instrument in securing those results. M. Schlæsing was able to melt a piece of iron, weighing 400 gms., in twenty minutes, by his plan."—(*Sci. Amer.*)

Aniline a Solvent for India-Rubber, etc.—The *Amer. Drug. Circ.* states that "Aniline possesses the property of dissolving caoutchouc, shellac, and several other resins. According to the reports of the French chemist, Gaultier de Chaubry, aniline colors can be dissolved in soap, grape and starch sugar, dextrine paste of potatoes, glycerin, glue, and in a decoction of the bark *Quillaya Saponaria*."

Hardening Plaster of Paris.—"Kuhlman, who has given much time to the study of the coloration of minerals, and their power of absorbing various organic substances, states that, if plaster of Paris, with enough water in it to give it the constitution $\text{CaO}, \text{SO}_3 + 2\text{HO}$, is steeped in a bath of hot pitch, it loses its two equivalents of water, which are replaced by a corresponding quantity of pitch, and that it then becomes very hard and susceptible of a polish, so that it would be available for the construction of many articles for ornament or use."—(Prof. MORTON, *Journ. Franklin Institute.*)

Wash for hardening Plaster Casts.—KNAUR and KNOP, of Leipsic, have published, after long years of experiment, a method for the hardening of plaster casts so that they can be washed and better preserved. The process consists in the application of a mixture of soluble glass with an albuminous substance, which latter forms a cement with lime and hardens when mixed with soluble glass.

"The stock bottles are prepared as follows: No. 1. Syropy soluble glass. No. 2. A solution of one part of caustic potash in five parts of water, which must be kept closely stoppered. No. 3. Sour milk, which is obtained by setting a pan of milk to sour and removing the curd. No. 4. A clear solution of lime-water.

"To apply the wash, shake up the milk and pour out as much as may be desired into a suitable vessel. Add the potash by drops from No. 2, until the casein precipitated remains dissolved, and the liquid is simply cloudy, but not colored. Add to this one-fourth its volume of soluble glass. The mixture must be prepared when wanted, as it will not keep. It can be applied with a clean paint-brush, and several coats can be given, if required, after the first is entirely dry. Black spots on the casts, produced by the iron of the plaster, generally disappear when the whole is dry. If the above mixture is not well applied, or if it does not harden, it can be washed off with a sponge by using the lime-water from No. 4, and the operation can be repeated.

"All attempts to harden the casts throughout the entire mass, by the addition of some substance to the water in which the plaster was originally stirred, proved unsuccessful."—(*The Press, of Phila.*)

Fusibility of Silica.—Two distinct modifications of silica are known to chemists. As it occurs in the first of these modifications, the silica is readily soluble in alkaline leys and in hydrofluoric acid; while it dissolves with comparative difficulty when in the second modification. To the first or amorphous modification belong the minerals opal and hyalite, also the infusorial earths, such as the well-known 'tripoli' or polishing powder. The specific gravity of the silica of this modification varies between 2.2 and 2.3. The second modification, the specific gravity of which is equal to about 2.6, and which is often found in nature in the form of crystals, includes quartz, rock crystal, and amethyst, as well as silicious sand, and the sand-stones which have been formed by the agglomeration of particles of the latter. As an appendix to this second class a third list is often made out of the semi-crystalline varieties of silica, viz., chalcedony, chrysoprase, flint, and hornstone.

"It has long been known to manufacturers of crucibles, fire-brick, and the chemical compounds of silicic acid, that the quality of the sand employed in their mixtures may exert a marked influence upon the fusibility of these mixtures or upon that of the products obtained from them. The sand of certain localities has thus come to be sought for by one class of manufacturers who desire to melt their materials readily, or with the least possible expenditure of fuel; while the same sand is held in no repute by those who aim to produce highly infusible products.

"Some light has been thrown upon this point by the experiments of Bischoff, a German chemist, though his results do not go to corroborate so fully as might have been anticipated the old division of silica into two modifications. Samples of each of the common varieties of silica having been ground to impalpable powder in agate mortars, this powder was boiled with muriatic acid in order to remove any trace of impurity, and was afterward rinsed with water. The moist powder was then moulded into little cylinders or prisms, which, after having been placed in crucibles of the most refractory fire-clay obtainable, were exposed to a degree of heat superior to that at which cast-steel melts. From the results of these trials it appeared that flint and rock crystal are the most difficultly fusible of all the varieties of silica. The external surfaces of the test cylinders composed of these minerals were glassy after the ignition; but, on breaking the cylinders, their fractured surfaces exhibited nothing vitreous, but only a granular structure. In the case of opal, vitreous spots were noticed upon the fractured surfaces. After opal, as regards

refractoriness, followed amethyst, chalcedony, hornstone, hyalite, crystallized quartz, and milky quartz, all of which exhibited a fracture more vitreous than granular. Least difficultly fusible of all was the infusorial earth.

"Mixtures of amorphous silica and alumina or clay were found to be less difficultly fusible than pure silica. Mixtures of crystallized silica with fire-clay are also, it is true, somewhat less difficultly fusible than the pure silica; but they are decidedly more refractory than the mixtures which contain amorphous silica. It will perhaps be found that while the amorphous silica may act as a flux and lessen the refractoriness of the clay, the crystallized silica may, on the contrary, increase its power of resisting heat.

"The predilections of manufacturers for the silica of special localities now admit of explanation. It is by no means a matter of indifference to the manufacturer of refractory wares, which are intended to withstand intense heat, what kind of silica shall be mixed with the clay. If, for example, there were to be used the amorphous infusorial earth, no such refractory product would result as could be obtained by employing crushed flints or clean quartz sand. For the manufacturer of silicate of soda, on the contrary, this same infusorial earth would be far more valuable than the crystalline sand."—(*The Nation.*)

"*Lacquers.*—Lacquers are used upon polished metals and wood, to impart the appearance of gold. As they are wanted of different depths and shades of colors, it is best to keep a concentrated solution of each coloring ingredient ready, so that it may at any time be added to produce any desirable tint.

"1. *Deep Golden-colored Lacquer.*—Seedlac, three ounces; turmeric, one ounce; dragon's blood, a quarter of an ounce; alcohol, one pint. Digest for a week, frequently shaking. Decant and filter.

"2. *Gold-colored Lacquer.*—Ground turmeric, one pound; gamboge, an ounce and a half; gum-sandarach, three pounds and a half; shellac, three-quarters of a pound (all in powder); rectified spirits of wine, two gallons. Dissolve, strain, and add one pint of turpentine varnish.

"3. *Red-colored Lacquer.*—Spanish anatto, three pounds; dragon's blood, one pound; gum-sandarach, three pounds and a quarter; rectified spirits, two gallons; turpentine varnish, one quart. Dissolve and mix as the last.

"4. *Pale Brass-colored Lacquer.*—Gamboge, cut small, one ounce; Cape aloes, ditto, three ounces; pale shellac, one pound; rectified spirits, two gallons. Dissolve and mix as No. 2.

"5. Seedlac, dragon's blood, anatto, and gamboge, of each a quarter of a pound; saffron, one ounce; rectified spirits of wine, ten pints. Dissolve and mix as No. 2.

"The following recipes make most excellent lacquers:

"1. *Gold Lacquer.*—Put into a clean four-gallon tin 1 pound ground turmeric, $1\frac{1}{2}$ ounces of powdered gamboge, $3\frac{1}{2}$ ounces of powdered gum-sandarach, $\frac{3}{4}$ of a pound of shellac, and 2 gallons of spirits of wine. After being agitated, dissolved, and strained, add one pint of turpentine varnish, well mixed.

"2. *Red Lacquer.*—2 gallons of spirits of wine, 1 pound of dragon's blood, 3 pounds of Spanish anatto, $4\frac{1}{2}$ pounds of gum-sandarach, 2 pints of turpentine. Made as No. 1 lacquer.

"3. *Pale Brass Lacquer*.—2 gallons of spirits of wine, 3 ounces of Cape aloes, cut small, 1 pound of fine pale shellac, 1 ounce of gamboge, cut small, no turpentine varnish. Made exactly as before.

"But observe that those who make lacquers frequently want some paler, and some darker, and sometimes inclining more to the particular tint of certain of the component ingredients. Therefore, if a four-ounce phial of a strong solution of each ingredient be prepared, a lacquer of any tint can be procured at any time.

"4. *Pale Tin Lacquer*.—Strongest alcohol, 4 ounces; powdered turmeric, 2 drachms; hay saffron, 1 scruple; dragon's blood in powder, 2 scruples; red saunders, $\frac{1}{2}$ scruple. Infuse this mixture in the cold for 48 hours, pour off the clear, and strain the rest; then add powdered shellac, $\frac{1}{2}$ ounce; sandarach, 1 drachm; mastic 1 drachm; Canada balsam, 1 drachm. Dissolve this in the cold by frequent agitation, laying the bottle on its side, to present a greater surface to the alcohol. When dissolved, add 40 drops of spirits of turpentine.

"5. *Another Deep Gold Lacquer*.—Strongest alcohol, 4 ounces; Spanish anatto, 8 grains; powdered turmeric, 2 drachms; red saunders, 12 grains. Infuse and add shellac, etc., as to the pale tin lacquer; and when dissolved add 30 drops of spirits of turpentine.

"Lacquer should always stand till it is quite fine, before it is used."—(*Larkin's Brass and Iron Founder and Sci. Amer.*)

"*Reduction of Silver Oxide*. By. DR. ALEXANDER CLASSEN.—Silver oxide is easily reduced to the metallic state by means of cadmium. A solution of nitrate of silver is evaporated with sulphuric acid until all the nitric acid is driven off. The sulphate of silver is then dissolved in hot water, and a stick of cadmium is placed in the solution. The reduction of the silver oxide proceeds immediately, the metallic silver is easily separated from the cadmium, and collected in a mass which can be washed by decantation with hot water without loss. A previously tarred porcelain crucible will serve to effect the reduction in. As the reduced silver may possibly have a little cadmium mixed with it, it is well to heat the acid liquor until no evolution of hydrogen takes place. In the clear liquid which remains, not a trace of silver can be recognized. The reduced silver is now washed until the washings give no precipitate with chloride of barium, then dried, and lastly ignited, by which the grayish black of the precipitate is changed to silver white.

"The author here quotes some weighings to show the accuracy of the results.

"The reduction of silver compounds by means of cadmium, he states, goes on very quickly, and as cadmium is but slightly soluble in dilute acids, the same piece of metal will serve for several operations, without even losing the metallic lustre of the surface.

"Freshly-precipitated chloride of silver may be reduced in the same way."—(*Journ. fur prakt. Chem. and Chem. News.*)

"*Exceedingly Hard Iron*.—Some years ago, M. GAUDIN found that by heating iron, tolerable free from carbon, with a small quantity of boron, to a very high temperature, he obtained a product which could not be forged, but which possessed extraordinary hardness. He has now found that an equally hard metal may be obtained by adding to ordinary cast-iron, in fusion, phosphate of iron and peroxide of manganese—he does

not mention in what proportions. The product cannot be forged, but it casts easily, and is therefore readily applicable to the construction of such machines, or parts of machines, as require in their material extreme hardness rather than tenacity. The metal so produced is, moreover, singularly sonorous, and M. Gaudin accordingly proposes it as a material for bells. He finds that a still harder metal is produced by the addition of tungsten—again he omits to say in what amount—to ordinary cast-iron. He states that this tungsten iron surpasses everything previously known as a material for tools for cutting rocks, and that crystals of it will cut glass as readily as the diamond.”—(*London Mechanics' Magazine and Druggists' Circular.*) —

“*Silvering Copper and Brass Surfaces.*—M. BOUDIER recommends a powder composed of 12 parts cyanide of potassium, 6 parts nitrate of silver, and 30 parts prepared chalk. Rub the surface to be silvered with a moist rag which has been dipped in this powder, and a deposit of silver takes place which is strongly adherent, and may be used advantageously to apply to some utensils before bringing them in contact with acid fruits.”—(*Journal of Applied Chemistry.*) —

“*To Extract Silver Plating.*—An important problem is that of readily obtaining pure silver from old, worn-out plated utensils of copper, etc. A recent number of the *Moniteur Scientifique* publishes valuable information on the subject, by M. Soelzel. The best method consists in treating the plated work with sulphuric acid in which from 5 to 10 per cent. of nitrate of soda has been dissolved. The silver disappears as if by magic in this solution, before any of the copper is at all acted upon.”—(*Ibid.*) —

“*To Facilitate the Soldering of Steel.*—Take 4 parts native sulphate of baryta, $\frac{1}{2}$ part broken glass, and $\frac{1}{2}$ part binocide of manganese; mix, and rub all in a mortar. The fine powder is then used instead of sand for soldering. This powder can be heated to a very high temperature, is cheap, and has no action on steel.”—(*Dingler's Polytechnische Journal and Ibid.*) —

To take Rust from Iron.—It is stated (*Ibid.*) “that beeswax rubbed on when the iron is moderately heated, and the iron smartly rubbed on a woolen cloth, will remove rust entirely.” —

To Loosen Rusty Screws.—The *Sci. Amer.* says that “to start rusty nuts put a few drops of kerosene in the end of the bolts, so that it will penetrate the threads, and the screw will immediately loosen.” —

“*A Metal that Expands in Cooling.*—Lead, 9; antimony, 2; bismuth, 1 part. This metal is very useful in filling small defects in iron castings, etc.”—(*American Artisan.*) —

“*Fusing of Iron with Brass.*—Iron may be cast upon brass, so that both will be perfectly united, by fusion. For this purpose the brass part of the compound casting must be made with a large proportion of copper, so as to be very hard. When the part first cast is cooled, it should be placed in its proper position in the mould, and the other metal poured upon it in the usual manner.”—(*Journal of Applied Chemistry.*)









